

DOCUMENT RESUME

ED 201 990

CS 006 088

AUTHOR Stein, Nancy L.; Trabasso, Tom
 TITLE What's in a Story: An Approach to Comprehension and Instruction. Technical Report No. 200.
 INSTITUTION Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
 SPONS AGENCY National Inst. of Education (ED), Washington, D.C.
 PUB DATE Apr 81
 CONTRACT 400-76-0116
 GRANT NIE-G-77-0018; NIE-G-79-0125
 NOTE 133p.
 EDRS PRICE MF01/PC06 Plus Postage.
 DESCRIPTORS *Cognitive Processes; Knowledge Level; *Learning Theories; Primary Education; *Reading Comprehension; Reading Instruction; Reading Processes; *Reading Research
 IDENTIFIERS *Schema Theory

ABSTRACT

In providing an integration of current research in story comprehension, this paper first offers a selective overview and summary of the current approaches to story comprehension, specifically schema theory, and highlights the central concepts arising from several different perspectives on story comprehension. The paper next reviews the empirical research to illustrate how recent advances in theory have added to the knowledge of the comprehension skills of children, especially those in the primary grades. The paper then discusses some of the main conclusions and issues in the area in terms of theoretical and empirical advances and applications to school settings. (FL)

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Technical Report No. 200

WHAT'S IN A STORY: AN APPROACH TO COMPREHENSION AND INSTRUCTION

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April 1981

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To appear in R. Glaser (Ed.), Advances in the Psychology of Instruction
(Vol. 2). Hillsdale, N.J.: Erlbaum, in press.

We wish to thank Janellen Huttenlocher, Charles Perfetti, and Rick Omanson for their comments on an earlier draft of this paper. We are especially indebted to Robert Glaser and Jean Mandler for their thorough and constructive feedback on the same draft. The writing and research reported in this paper was supported by National Institute of Education grants NIE-G-77-0018 and NIE-G-79-0125 to Tom Trabasso. In addition, the authors were supported in part by the National Institute of Education under Contract No. HEW-NIE-C-400-76-0116 to the Center for the Study of Reading, University of Illinois.

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What's in a Story:
An Approach to
Comprehension and Instruction

Stories are an integral part of the school curriculum and are used widely in different content areas. As such, a primary objective of educators should be to discover methods which would ensure that children comprehend narratives as well and as accurately as possible. To determine whether children have acquired the appropriate comprehension skills, teachers and reading educators have used five basic tasks that are considered to be good indicators of narrative understanding. These tasks include the following skills:

1. finding the main or the most important ideas in a narrative;
2. detecting or inferring cause and effect relationships among events;
3. ordering narrative events in the correct temporal sequence;
4. making inferences from the information given in a text and using this inferential information to make judgments about the text;
5. paraphrasing or summarizing the events depicted in a narrative.

An additional and less frequently used indicator of narrative comprehension is the child's ability to produce or write stories.

For the most part, explanations of how children learn these skills have been understood at the intuitive, descriptive level, both in terms

of the teacher's and reading educator's expertise. Consequently, certain of these skills (see Steuer & Murphy, 1979, for an indication of some of the current beliefs about how these tasks should be taught). Although some of these beliefs are well founded, many have arisen from the paucity of knowledge in the area of story comprehension, as well as from a lack of consensus as to what constitutes good comprehension skills. Perhaps with more systematic research on the comprehension process, our beliefs can be altered or substantiated, and the instructional process improved.

During the past half-dozen years, there has been an upsurge of interest, from a psychological point of view, in the investigation of skills similar to those considered to be important in a school setting. Although most of these psychological studies do not deal with particular methods of instruction on how to comprehend a story, these studies do indicate some of the more powerful factors that influence whether comprehension occurs and whether children construct coherence interpretations of the stories they hear or read. By using the results from recent studies, guidelines can be proposed for the development of instructional procedures that insure a high rate of comprehension and learning.

The purpose of this paper is to provide an integration of current research in story comprehension. First, a selective overview and summary of the current approaches to story comprehension is given, highlighting the most central concepts arising from several different perspectives on story comprehension. Second, a review of the empirical research is included, illustrating how recent advances in theory have enriched our

knowledge of the comprehension skills of children, especially those in the first years of elementary school. Third, some of the main conclusions and issues in the area are discussed in terms of theoretical and empirical advances and applications to school settings.

SCHEMA-THEORETIC APPROACHES

One promising approach to narrative comprehension has been the development and expansion of a particular theoretical viewpoint, generally termed "schema" theory. Recently, this orientation has become more widespread in acceptance and has been used to interpret a variety of findings on text comprehension. As a result, we feel that a short summary of the origins and use of the term schemata will aid in the understanding of current story research.

Origins of "Schema" Theory

The core components of "schema" theory are derived from Bartlett's (1932) use of the term schemata and his interpretation of adults' memory for narratives. The major finding Bartlett felt compelled to explain when adults recalled stories was the lack of verbatim recall. Bartlett was struck by the fact that story recall almost always included blendings of information, inventions of new detail, temporal transformations, and selective omissions of information. Because his findings did not support the then popular trace-theoretic notions of memory (which assumed that memory was like an exact "replica" of incoming information), Bartlett

constructed a new framework arguing for the necessary role of "prior experience" in one's memory for narrative information.

Bartlett felt that listeners or readers used their prior experience or knowledge to construct "expectations" about what should occur in a story. These expectations would influence how a text was remembered because the reader or listener would continually interpret incoming information using what he or she already knew and expected. Bartlett labeled these prior experiences "schemata," because he felt that this concept captured the assumption that one's prior experience was highly organized in structure and operation. In describing the role of schemata in comprehension, Bartlett continually emphasized the interactive nature of schemata with the input, focusing on the integration of new information with already existing knowledge. He argued that there were instances when expectations would be so strong that a listener would transform incoming information and construct a representation that corresponded more to what was expected rather than to what had been read or heard.

Bartlett's thinking has influenced current work through his refinement and use of the concept of schemata, and because he operated within a broad theoretical framework. Adhering to Bartlett's basic assumptions, several investigators have attempted to extend his thinking by describing various properties of schemata (Anderson, 1977, 1978; Rumelhart, 1975; Thorndyke & Yekovitch, 1980; Winograd, 1977) and the structural organization

of specific story schemata (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1979; Thorndyke, 1977).

Properties and Functions of Schemata

The properties and functions of schemata are fairly well agreed upon despite the variations in approaches to describing the structure of narrative knowledge. Schemata are generally thought to be composed of generic or abstract knowledge (Anderson, 1977, 1978; Kintsch & van Dijk, 1978; Mandler & Johnson, 1977; Rumelhart & Ortony, 1977; Stein, 1979; Stein & Glenn, 1979; Thorndyke & Yekovitch, 1980) and reflect the prototypical properties of various experiences encountered by an individual.

In the process of schema formation, an individual integrates over many instances. The end product of this integration often includes events, dimensions, or information that was not directly observed by the individual. A schema also need not be open to consciousness by the person using it and the formation may also proceed unconsciously (Bransford & Franks, 1971; Bransford & Johnson, 1973; Bransford & McCarrell, 1974). Although schemata are assumed to reflect an individual's experience (and therefore could possibly reflect idiosyncratic knowledge) these structures are assumed to be general and shared across individuals. Once formed, they are thought to be relatively stable over time.

Schemata are assumed to be acquired and altered or changed by induction from prior or ongoing experience. A story schema, for example, is thought to be acquired from the listening to, the reading of, and the

viewing of a variety of narratives, from direct instructional experience in a school setting, and from one's personal participation in everyday social interaction (Mandler & Johnson, 1977; Stein, 1979; Stein & Glenn, 1979; Thorndyke & Yekovitch, 1980). Although most investigators are intensely interested in the acquisition process, this is the one area where the least is known. Most studies concentrate on the end product of acquisition, rather than the process itself.

The organizations and structure of narrative schemata have been described in a variety of ways. Central to nearly all the descriptions is the notion of a sequence of events that are causally related (Schank & Abelson, 1977; Warren, Nicholas, & Trabasso, 1979). An additional property proposed by some investigators (Black & Bower, 1980; Mandler & Johnson, 1977; Rumelhart, 1977; Rumelhart & Ortony, 1977; Stein & Glenn, 1979) is that schemata can be embedded in other schemata, creating a hierarchical knowledge structure. An example of hierarchical embedding occurs in a narrative schema when there is a superordinate goal, which can be broken down into a series of subgoals necessary for the successful attainment of the main goal. The achievement of each subgoal constitutes an episode (or schema) which is embedded in the episode for attaining the higher order goal.

Given these inherent properties of schemata, what functions do they serve? Most of the current research on stories would be accurately described as studying the influence of schematic knowledge on the retrieval

or output of information (Bower, Black, & Turner, 1979; Mandler, 1978, 1979; Mandler & Johnson, 1977; Nezworski, Stein, & Trabasso, Note 3; Stein & Glenn, 1979; Stein & Nezworski, 1978; Thorndyke, 1977). In other research on narrative comprehension, schemata are thought to guide encoding, organization, representation, and retrieval of information. The use of narrative schemata during the encoding process has been studied directly by examining how children describe events in pictorial sequences (Poulsen, Kintsch, Kintsch, & Premack, 1979; Asp, Johnson, & Trabasso, Note 1; Day, Stein, Trabasso, & Shirey, Note 2).

Likewise, how a reader or listener uses schematic knowledge to organize incoming information has been studied. In particular, schematic knowledge has been shown to have a significant effect on the organization of ambiguous or disorganized stories (Pichert & Anderson, 1977; Stein & Nezworski, 1978). By varying the type of instructions given to subjects before encoding, these studies have illustrated that the active use of schemata can ensure better organization of a text (Stein & Nezworski, 1978), as well as the reorganization of ambiguous text information into more coherent points of view (Pichert & Anderson, 1977).

In the process of encoding, representing, and retrieving narrative knowledge, schemata are assumed to guide the comprehender in constructing hypotheses about what types of information should occur in the text and what type of logical connections should link the various events in a narrative sequence. For example, narrative schemata specify the components

of a story which should be included in a text, the temporal sequence of the narrative events, and the type of causal relations which should connect the events. By using schematic knowledge, the listener or reader can determine whether certain parts of a story have been omitted and whether the story events occur in a sequence corresponding to real-time physical order. During the encoding and representation of a story, missing events may be inferred to fill in the omitted information and events may be reordered to correspond to a real-time sequence. In retrieval, a schema functions in a similar manner. Encoded events are selected for retelling or production according to the specification of the particular schema being used.

Many studies (Mandler, 1978, 1979; Stein, 1979; Stein & Glenn, 1979; Stein & Nezworski, 1978; Stein & Glenn, Note 4) have shown that the use of schematic knowledge is so powerful that listeners have little control over the types of retrieval strategies used during recall of narrative information. Even when listeners are instructed to reproduce texts in a verbatim form, they cannot do so when the text contains certain types of omissions or certain sequences of events. Instead, a listener is more likely to recall the text in an order which includes the types of information specified by the story schema. In this sense, current findings are congruent with many of Bartlett's original ideas.

While less studied as such, schemata can also be used as retrieval plans during the production or generation of novel stories, facilitating the organization and integration of existing but discrepant information

in long-term memory. Similarly, schemata for other forms of discourse can also influence the writing or production process. For example, rhetorical or conventional argument forms can be used to construct new arguments, conventional scientific formats can be used to write research reports (Kintsch & van Dijk, 1978) or rhetorical concept forms can be used to generate texts necessary for the acquisition of a new concept. In using any of these forms, the production process may be greatly facilitated if the appropriate schemata have been acquired and can be used during retrieval.

Descriptions of Story Structures

Besides describing the functions and properties of schemata, recent research on story comprehension has provided detailed descriptions of the structure and content of story schemata, as well as a set of predictions concerning the quality of comprehension. Several studies also contain data directly related to the comprehensibility of narratives included in basal reading series (Baker & Stein, 1981).

These results should be valuable to teachers and those constructing basal readers because most teachers do not have the necessary time or means to assess accurately a child's knowledge of narrative events. As a result, teachers rely heavily on the material presented in a basal reading series, and hope that reading companies have given serious attention to the issues of "readability" and "comprehensibility" of texts for children at different reading levels.

Most basal reading series, however, are not developed on the basis of a well-formed theory of comprehension. Thus, comprehension of the text material is not necessarily guaranteed. Many of these texts omit lexical and semantic information necessary for accurate comprehension. These omissions occur more frequently in texts for young elementary school children, where the need for explicitness is even higher than for older children (Fredericksen, Note 5).

Thus, the explication of the structure and content of story knowledge, how this knowledge is used, as well as what happens to comprehension when the text does not correspond to a child's knowledge will help writers of curriculum material and teachers in the construction of methods to ensure good comprehension. In the following sections, we provide a summary of the recent structural and semantic descriptions of narrative knowledge.

A Simple Story Schema

Most investigators interested in story structures (Johnson & Mandler, 1980; Mandler, 1978; Mandler & Johnson, 1977; Rumelhart, 1975; Stein, 1978, 1979; Stein & Glenn, 1979; Thorndyke, 1977; Thorndyke & Yekovitch, 1980) have argued that story knowledge is organized either in the form of rewrite rules containing knowledge about the generic structure of stories, or as goal-directed problem solving episodes (Black & Bower, 1979; Rumelhart, 1977). Although these approaches differ in emphasis, the description of simple story episodes is highly similar. The episodic schema can be described as a hierarchical network of story categories

and logical relationships connecting these categories. Categories represent the different types of information that recur in most stories. The logical relations connecting the categories specify the degree to which information in one category influences the occurrences of events in subsequent categories.

The initial division in the story structure consists of two parts: the Setting category plus the Episode. The Episode is the basic higher-order unit of analysis in a story and contains a sequence of five different categories. Each category contains specific types of information and serves a different function in the schema. Table 1 contains a description of each of the categories in a simple narrative, the logical relations connecting each category to the adjacent one, and an example of a story broken down into each of the basic categories. The categories described correspond to those used by Stein and Glenn (1979) and bear a close resemblance to categories in other grammars cited above.

Insert Table 1 about here.

As Table 1 indicates, the story begins with the introduction of the protagonist, and usually contains one or more statements about the physical, social, or temporal environment in which the remainder of the story occurs. The Setting is not considered a part of the Episode, as it is not usually directly related to the subsequent sequence of events described in the episode. However, the Setting information allows for interpretation of

subsequent events. Thus, information in the Setting category may constrain the possible events that can occur in the Episode.

The Episode consists of five different categories. The Initiating Event, the category beginning the Episode, contains information that marks some type of change in the protagonist's environment. Its major function is to evoke a desire in the protagonist to achieve some sort of goal (or change of state). The goal, included in the second category, Internal Response, is the most critical part of the story, for it is proposed that story knowledge is basically organized around the goal of a protagonist. The Internal Response category not only contains the statement of a goal, but it may also include an emotional reaction to the Initiating Event, and thoughts or plans about how to achieve the goal. The primary function of this category is to motivate the protagonist to carry out a set of overt actions, defined as the Attempt category. The protagonist's Attempt is representative of an internal plan of action which is externalized, for the purpose of achieving his goal. The Attempt then results in the Consequence, signifying whether or not the protagonist attained the goal. The final category, Reaction, can include one of several types of information: The character's emotional and cognitive responses to the goal attainment, the events that occur as a direct result of having attained a goal or, frequently, the Reaction can include a moral, summarizing what the character may have learned from achieving a particular goal, or admonishing the reader about the futility of attaining the goal under consideration.

In all of the recent descriptions of story structures, it is evident that each category in an episode could directly cause the occurrence of the subsequent category. One exception to a direct causal chain concerns the relationship between the Attempt and Consequence. It has been proposed (Mandler & Johnson, 1977; Stein & Glenn, 1979) that the protagonist's actions can directly cause the Consequence to occur. However, in some stories, the Attempt may merely "enable" the occurrence of the Consequence. For example, in a story used by both Mandler and Johnson (1977) and Stein and Glenn (1979), the protagonist, Epaminondas, agrees to carry a cake to his grandmother's house (an Internal Response-goal). He wraps it in a leaf (Attempt), puts it under his arm (Attempt), carries it to his grandmother's (Attempt), and when he arrives (Consequence), the cake is all crumbled (Consequence). Here, the acts of wrapping the cake in a leaf and carrying the cake underneath the arm may have physically resulted in the cake crumbling. In other stories, however, the relationship may be less direct. The Attempt may set up the necessary preconditions, but not directly cause the Consequence. As an illustration, consider a fox who wanted to catch a chicken for supper (Internal Response-goal). The fox went to a hen house (Attempt), set a trap for the chicken (Attempt), and then waited for the chicken to fall into the trap (Attempt). Independent of what happened at the end of this story, the fox's Attempt did not directly cause the Consequence. Rather, it established the preconditions for the occurrence of the Consequence. Although there are

variations in the relations linking the Attempt and Consequence, the organization of story events is, for the most part, assumed to be causally constrained. As a result of the causal chaining, certain types of information must be included in a story, and must occur in a temporal sequence that corresponds to the real-time order of events.

It should be emphasized that these descriptions of stories refer to the reader's or listener's story knowledge, and not to the structure of stories that exist in texts. This point is important because the structure of texts may not correspond to the proposed internal organization of story knowledge. For example, Internal Responses and Reactions are often deleted from the text structure of an episode and must be inferred. At other times, the text begins with the character's Internal Response, and may not include an Initiating Event. We assume, however, that although these categories are omitted from the text structure, they are inferred and are included in the underlying representation of the story in memory.

We emphasize the difference between the text structure and the underlying cognitive structure, created by the reader or listener because not only do category omissions occur in many texts but temporal inversions also occur. Some investigators (Black & Wilensky, 1979; de Beaugrande & Colby, 1979) have assumed that inversions or deletions in a text sequence are representative of the organization of the underlying cognitive structure of stories. However, these transformations are rarely found in

story recall, production, or recognition. Under most conditions, the story teller, listener, or reader constructs a representation of events corresponding to the real-time order of occurrence rather than to the narrative time sequence.

In order to account for the few instances where omissions and inversions of information do occur in story recall, a small set of transformational rules have been proposed for recall. These rules are used to transform information as it is retrieved from long term memory and communicated in either an oral or written mode. For example, children often recall or tell their own stories without directly stating the emotional responses or major goal of the protagonist (Mandler & Johnson, 1977; Stein & Glenn, 1979; Glenn & Stein, Note 6). Yet, from every other indication, it is clear that the protagonist's behavior in the story is purposeful and intended to achieve a certain outcome. The use of a transformational rule would include telling a story without the inclusion of certain core categories. We would argue that these children have chosen to use a deletion rule and have assumed that the intentions of the protagonist can be inferred from other events in the story.

The possible transformation rules used during retrieval have been discussed in detail by Johnson and Mandler (1980) and Stein (1979). Johnson and Mandler describe the formal properties of these rules. The primary function of the rules is to reduce the redundancy in a message, and to enable more efficient processing of information. The rules are

similar to van Dijk and Kintsch's (1978) macrostructure rules and Grice's (1975) conversational postulates. Gricean postulates, however, are more general. They pertain to the conventions used to ensure the comprehensibility of a message, as well as to increase the efficiency of information retrieval.

Complex Story Schemata

Up to this point, we have discussed the organization of only a simple one-episode story: Those narratives with only one protagonist who is presented with a problem to solve, formulates a goal, constructs a plan, turns it into an overt attempt, and either attains or does not attain the goal. One difficulty is that many stories are concerned with the resolution of problems involving other characters, thereby increasing the complexity of the story structure. If stories correspond to our knowledge of everyday social interaction, they would contain information about the various problems that people solve in the course of social interchange. For example, achievement of most social goals is usually impeded by an obstacle in the path of the protagonist either from a physical or interpersonal source. Thus, it becomes important to characterize the type of goal structures and obstacles that may be incorporated into an individual's story schema (Stein & Goldman, in press). Several attempts (Bruce & Newman, 1978; Goldman, in press; Stein & Goldman, in press; Glenn & Stein, Note 6; Stein, Trabasso, & Garfin, Note 7; Wilensky, Note 8) have been made to describe these components of story structure.

One of the first steps in describing the goal structure of a story is to determine the individual or interactive nature of the goal state to be attained. Depending upon the nature of the goal, different decisions must be made about the possible plans to attain the goal. For example, the goal of the protagonist may be non-interactive, but the protagonist must still consider the necessary preconditions that must be met in order to attain this goal. Obstacles in the form of the environment, the protagonist's own priorities, and the goals of others can develop and prevent successful goal attainment. If the goal of the protagonist is interactive and concerns other characters (e.g., concerns another individual), the protagonist must determine how the other individual's goals are going to interact with his. Two types of goal structures are possible, namely, a conflict where the goals of the protagonist and a second character are mutually exclusive, and a cooperation situation where the goals of the protagonist and another character are in agreement with one another.

As an example, suppose a protagonist desires an end state that will be of self-benefit, but in order to achieve her desired goal, she must rely on the cooperation of another person. In this situation, an individual goal is the end target, but the attainment depends upon the success of the protagonist in interacting with another person. Often, the protagonist does not succeed in ensuring cooperation from a second character because the second character's goals are in direct conflict with the

protagonist's goals. The protagonist has at least three options: (a) she can use techniques to get the second character to abandon his goal, and adopt one more in synchrony with her own; (b) she can attempt to generate another plan, not involving the cooperation of the second protagonist; (c) she can abandon her goal, and possibly substitute another.

Although this analysis does not exhaust all of the possible ways in which a story sequence progresses, it does impart the flavor of several recent analyses of more complex stories (Goldman, in press; Stein & Goldman, in press; Wilensky, Note 8). These descriptions of goal structures are somewhat similar to those offered by Lewin (1931, 1935, 1936, 1948) in his field theory approach to adolescence, describing the life-space of an individual.

The heart of recent descriptions includes plans that are constructed to overcome obstacles or to meet specific preconditions necessary for attaining a goal. For example, after deciding upon a goal, the protagonist often generates a plan to obtain a goal, entailing knowledge about a set of actions that would meet the preconditions for attainment of the goal. Failure occurs when the standard preconditions change, or when new preconditions must be met. As an example, suppose a story began by introducing a little girl who feels very lonely because she has nobody to play with, so she decides that she wants to get a puppy dog. She thinks about how she is going to accomplish this task and decides upon a plan. First, she will go and ask her mother if she can get one. If the mother says yes, then she will go to the store and pick out the one she wants, then

she will bring it home. Goldman (in press) has shown that children's plans to obtain certain goals correspond to sequences of this sort with older children adding more standard preconditions in their initial goal plan than do younger children.

Stories such as folktales, however, usually contain obstacles so that some of the preconditions necessary for goal attainment cannot be met. For example, one precondition important for goal attainment of a puppy concerns the permission of a parent. Suppose the parent denies permission. In order to obtain the goal, a new plan must be generated to overcome this obstacle. This situation corresponds to our description of the alternatives available when the protagonist has to secure the cooperation of others. In the above example, cooperation is refused, most likely because the parent's goals are in conflict with those of the child. The little girl has several alternatives. She can attempt to bring the parent's goal in line with her own, possibly by determining why the parent objects, and then meeting those objections. Alternatively, she could buy a puppy, and convince one of her friends to keep it, thereby circumventing parental objection. Possibly, she might decide to substitute another goal to assuage her present state of loneliness.

A tree diagram is an excellent aid for mapping out the progression of steps necessary to pursue the different alternatives. Although choices of alternative paths do vary in stories with each type of goal structure,

some paths or solutions occur more frequently than others. Analysis of plot themes (Levi-Strauss, 1955) shows that goal structures are constrained both by the social acceptability of values and by the experience of the story teller.

The story grammars (Johnson & Mandler, 1980; Mandler & Johnson, 1977; Stein & Glenn, 1979; Thorndyke, 1977) can also account for structural variation in multiple-episode stories containing more than one protagonist. As illustrated previously, each episode in a story contains one goal plus an attempt and a resolution through goal attainment. The grammars specify the way in which multiple-goal-based stories are structured by describing the permissible ways in which an individual episode can be linked to another episode in a story. These rules are an attempt to illustrate how various goal structures of one or more characters can be logically related to one another. We illustrate these rules with the following descriptions.

In the existing grammars, any two episodes in a story structure can be connected by one of three relationships: And, Then, or Cause. The And relation describes an episode structure where two episodes occur in a temporal sequence, according to narrative time, but where the episodes may have occurred in any order, or may have occurred simultaneously in real time. For example, many stories relate how two characters desire to pursue the same goal, e.g., a good, kind knight wants the hand of a beautiful princess, and an evil, villainous knight desires the same.

In the beginning of the story, a description containing two episodes may be given, explaining why each knight desires the hand of the princess, showing the plan of each knight to attain his goal, and relating the initial attempt to each one to win the princess. These two episodes occur in a sequence in the story line, but there is no a priori reason to believe that one episode occurred before another. In fact, many of the rhetorical markers in the story (e.g., meanwhile, at the same time, etc.) allow the reader to infer that the two episodes were occurring simultaneously. After the two episodes occur, each is usually related to a third episode by a Then relationship.

The Then relationship is used when one episode follows another and is meant to convey two types of logical relationships. The first is where one episode sets up the necessary preconditions for a second episode to occur, but does not directly cause the second to occur. The second usage of the Then relation is where one episode occurs before another but has no causal relation to the second. An example of the properties of the Then relation is where the good knight goes on a quest to prove his valor and worth. After an episode in which he succeeds in his quest, he can now present himself to the king as a person worthy of the princess. The episode in which he seeks and obtains his quest does not directly cause him to present himself to the king, for he might have chosen an alternative course of action to prove his courage. However, the events in the first episode set up the necessary preconditions for the goal and attempt to be accomplished in the subsequent episode.

As an example of the strictly temporal properties of the Then relation, consider the following sequence. Suppose the knight had to perform two unrelated quests, and that these could be done in any order. In the first episode, he obtains a golden fleece and in a second episode a golden egg. The success of the first episode neither causes nor enables the occurrence of the second episode. However, the two episodes do occur in a temporal succession.

The third type of connection, the Cause relation, implies a direct connection between two episodes such that the first episode directly ensures the occurrence of the second episode. Certain problems arise in deciding whether episodes are connected by the Then or Cause relation, because the perception of a direct causal link depends upon the comprehender's knowledge about the events in the story. If more than one alternative episode can be generated after the occurrence of the first episode, the connection between the two episodes might be a Then relation. However, if the subject perceives that only one type of episode could result as a function of a previous episode, then the connection between the two episodes is likely to be a Cause relation. The types of relations connecting two episodes are strictly dependent upon the inferences made by a reader during the process of organizing the story information. The decision about the type of relationship connecting two episodes remains at an intuitive level, taking into account our naive notions of physical and psychological causality including notions of multiple, sufficient, and necessary causes.

Johnson and Mandler (1980) add an additional constraint to the identification of causally related episodes, stating that one episode must be embedded in another for a Cause relation to connect two episodes. Episode embedding occurs when a second episode begins before a first episode has ended. In the Johnson and Mandler grammar, a second episode can be embedded in a first episode in one of three locations: the beginning, the development or the ending. These structures are similar to Rumelhart's (1977), where he describes the organization of complex stories.

As an example of an embedded episode structure, we have modified part of a story used by Stein and Glenn (1979). The particular story, Judy's Birthday, contains an embedded episode, occurring when the protagonist needs the cooperation of a second person to attain her goal:

Judy is ten years old.

She is going to have a birthday,
and she wants a hammer and saw for presents.

Episode 1

Then she could make a coat rack
and fix her doll house.

She asked her father for them.

Episode 1 & 2

But her father did not want to get them for her,
although he did want to get her something.

So, he went out

and bought a beautiful new dress,
and gave it to Judy.

Judy was pleased but was sad that
she didn't get the hammer and saw.

Episode 2 & 1

The information up until and including Judy asking her father for the hammer and saw comprise the first episode, and includes information categorized into the Initiating Event, Internal Response, and Attempt categories. The consequence of the episode, however, is dependent upon the response from Judy's father, comprising the second episode. The second episode statements serve dual functions. For example, the act of Judy asking her father is an Attempt from Judy's point of view, but serves as the Initiating Event from the father's viewpoint because it forces him to formulate a goal. The consequence of the father's episode also serves as the consequence for Judy. Judy's reaction completes the embedded episode. Thus, the criterion for judging whether or not an episode is embedded in another is that one or more statements in one episode must also be part of a second episode.

The type of logical relationships linking episodes and the number of episodes in a story are thought to have significant effects on the comprehensibility of a story. Both Mandler and Johnson (1977) and Stein and Glenn (1979) have proposed that stories consisting of episodes linked by the Cause relation will be remembered better than episodes linked by either the And or Then relation. Presumably, causal relations can either be deduced logically or are known, whereas no a priori logical basis exists for And or Then relations. This prior knowledge leads to a greater likelihood of events being connected and thereby linked in a memory representation. Further, an analysis of stories with different types of

episodic relations reveals that episodes connected by the Cause relation often correspond more closely to the way in which social knowledge has already been organized by a listener. For example, episodes connected by the Cause relation often include a situation where a protagonist attempts to attain a goal, fails because one or more preconditions have not been met, and must generate a new plan to attain the goal. Although goal plans are often novel, knowledge about the important preconditions is already known, and thought to be stored in close association with the goal (Sacerdoti, 1977). Knowledge about the appropriate preconditions necessary to satisfy a goal probably serves as an organizing device in the retrieval or generation of plans to obtain the goal.

In stories where episodes are connected by the Then relation, the goals and resolutions between the episodes may not be as tightly organized as information between causally related episodes. For example, in several stories generated by children between the ages of 5 and 12 (Glenn & Stein, Note 6; Stein, Note 9) in the first episode, the protagonist formulates a goal and attains it; then he goes on to formulate and resolve a different goal sequence, etc. The individual episodes in these stories, although cohesive and purposeful within each episode, appear to be separate entities, even when one episode may enable the occurrence of a second episode.

EMPIRICAL FINDINGS

In this section, we will review the current literature on story comprehension as it relates to performance on tasks similar to those used in a

school setting. Three broad questions aid in organizing the data to be discussed: (1) What are the conditions under which children can detect, comprehend, and recall events that are causally related in a story? (2) What types of information are remembered and recalled in narratives? and (3) What information in a story is central or important? To answer these questions, we use data from the story comprehension literature, as well as studies focusing on more broadly based developmental questions.

Detection and Comprehension of Causal Relationships

Understanding a text involves interpreting specific events and making sense of the logical relations that connect those events. In the text, explicit markers or rhetorical devices can be used to specify the relationship between the two events, but for the most part, the causal relations linking events must be inferred from the temporal order of events and from prior knowledge about the text events. If the reader is not able to make text connecting inferences during the process of encoding, then the text will not be well understood or remembered (Stein & Nezworski, 1978).

The conditions and processes that influence inferential thinking are not fully understood. We do know that a reader's previous experience with stories and social situations play an essential role. A reader must rely on knowledge of the incoming text events, and impose some type of organization on them. If the reader has no prior knowledge of specific story events and their relationships, it is unlikely that the story sequence will be comprehended.

Assessing a child's prior knowledge of a text becomes an essential requirement for determining whether or not the child has the capability for accurate comprehension. If prior experience or familiarity with the story material is not controlled, children may perform poorly, leading to the conclusion that they lack the prerequisite cognitive operations (piaget, 1923/1960) or monitoring skills (Markman, 1979). As we shall see, it seems to have been easier to infer that young children are not capable of performing certain tasks, rather than determining what it is that young children know and/or can do. (See Brown, 1978; Bullock & Gelman, 1979; and Gelman, 1978 for excellent reviews and suggested alternatives for avoiding such problems.)

If knowledge or familiarity is controlled, however, a different picture of children's skills begins to emerge. In this review, we attempt to establish the minimal age at which young children have consistently performed accurately on tasks requiring the detection of cause-effect relations. We then attempt to illustrate where developmental differences have been found, and what instructional techniques can be used to maximize a child's understanding of a task.

Memory for Event Order

Piaget (1923/1960) and Fraisse (1963) are primarily responsible for much of the recent interest in children's sensitivity to the causal structure of narrative events. Piaget (1923/1960) was among the first to

emphasize the importance of causal relations in assessing story communication and comprehension. Similar to Bartlett (1932), Piaget understood that comprehension depended upon the ability of a child to understand events in relation to other events, not only their temporal relationships but the probabilities of one event occurring given the occurrence of a prior event.

Both Piaget (1923/1960) and Fraisse (1963) were convinced, however, that children in the pre-operational state of intellectual development did not have the skill or capacity to make use of causal relationships that could be inferred from a text. Piaget reported that in retelling stories, children frequently mixed up the order of events, and appeared not to be concerned or aware of the causal connections between them. But Piaget's explanations are difficult to interpret. On the one hand, he refers to the young child's inability to understand or to infer the correct sequence of events as the real problem. On the other hand, he refers to the young child's lack of communication skills as the primary source of difficulty.

In an effort to clarify Piaget's hypothesis, Brown and her colleagues carried out an extensive series of studies investigating children's memory for ordered sequences of events (see Brown, 1976, for a complete review of this work). She found that preschoolers were able to reconstruct accurately a series of ordered pictures with few or no errors in their sequence. In fact, when she presented these "ordered" events in a random sequence,

young children made significantly more errors, and often attempted to re-construct the sequence so that it would correspond to the ordered sequence rather than to the random event sequence. These results suggest that preschool children could not only remember an ordered series of events, but were dependent on events occurring in a specific order so that they could maximize the chances of understanding their logical relations. When Brown assessed children's skill at recalling the correct order of events, however, her results were more similar to Piaget's. She found that children made several ordering errors while attempting to remember certain narrative sequences. Brown attributed this difficulty to the young child's lack of expository skills rather than to an inability in remembering the correct event order.

Data from recent studies (Mandler & Johnson, 1977; Stein & Glenn, 1979; Day, et al., Note 2; Nezworski, et al., Note 3), however, show that children as young as 4 can recall the correct order of story events, provided the sequence corresponds to the "expected" causal order as described by the rewrite rules of the story grammars. Mandler and Johnson (1977) and Stein and Glenn (1979) suggest that one reason for the contradictory results found in young children's story recall might pertain to the content and structure of the stimulus material used in the studies. While all of the recent story studies controlled the content of the stories, with regard to the inclusion of specific types of information and a strict causal sequence, Mandler and Johnson (1977) and Stein (1979) have both

suggested that story materials used by Brown and by Piaget may not have corresponded to the logical category structure of available story knowledge, and thereby presented the children with a more difficult task to understand and recall.

After analyzing Piaget's stimulus materials, we found that children were indeed presented with stories that were not well-formed. To illustrate his claims, Piaget relied upon several stories, one of which, Niobe, is shown in Table 2. Several omissions and an inversion exist in

Insert Table 2 about here.

this tale. First, it is unclear as to exactly what motivates the lady's action to laugh at the fairy. The text specifically states the reason as being that the fairy had only one boy. However, states of possession do not directly cause an action. A goal or plan does. It would have been necessary for Piaget to include information as to why the fact of having only one son would cause a lady to scorn the fairy. Furthermore, the story contains two inverted events, 6 and 7. Although these statements are connected by a because relation, they are still inverted.

One could surmise that a 7-year-old child would argue that the story contained even more deletions than we have indicated. The surprising result, however, is that upon reanalysis of Piaget's data for this story we found only one temporal ordering error in all of Piaget's own data.

The average correlation between the order of events presented and the order in which they were recalled is .98. Most of the children deleted the inverted information from their recall or included only one of the inverted statements. There were elaborations occurring in recall, with most of the new information pertaining to omitted goals or goal statements. However, Piaget's children did not make many temporal ordering errors.

In a second story, Epaminondas, no data were presented by Piaget. The structure of this text corresponds most closely to what has been defined as a "well-formed" story. In both the Mandler and Johnson (1977) and Stein and Glenn (1979) studies, where a modified version of this story was used, there were very few temporal ordering errors. In the Stein and Glenn study, the average correlation between presentation and recall orders was .92 for first grade children and .98 for fifth grade children.

The contradiction between Piaget's claims and recent studies is solved. There is no contradiction. The 4-, 6-, and 7-year-old children in Piaget's study had little difficulty in recalling the original, temporal order of events, even when the text structure did not correspond identically to the canonical form described by the grammars. Children as young as 4 years have also been able to recall the exact order of "well-formed" stories (Day, et al., Note 6). We would not be surprised if it were discovered that 3- to 4-year-olds could also recall the

temporal sequence of narrative events, since these preschool children can identify the correct temporal order of events in a recognition task (Bullock & Gelman, 1979; Kun, 1978) and can generate their own stories according to real-time order (Pitcher & Prelinger, 1963).

Construction and Generation of Event Order

Teachers are often surprised that young elementary school children seem to have little or no difficulty recalling the correct order of story events, because the same children often experience difficulty when asked to order a series of events that appear in their basal reader workbooks. Several factors may be responsible. The primary one is that basal readers rarely specify exactly what is meant by the correct temporal sequence. Often, these texts include sequences, not ordered according to "real-time," but arranged in a coherent narrative order, where the ending occurs before the rest of the episode.

McClure, Mason, and Barnitz (1979) illustrate what happens when children are asked to order story sequences found in basal reading books. The purpose of the experiment was to determine how well the initial sentence in a story oriented the child to the "correct" story sequence. They constructed three different versions of a six sentence story. In one, the conclusion occurred first in the sequence; in another, the sequence began with a question about whether or not a goal of the protagonist would be achieved; the third began with the normal setting information, and adhered to the real-time order of events. The remaining

sentences in the story were scrambled. Children from the third-, sixth-, and ninth-grade were asked to re-order the events so that the event order corresponded to the "correct sequence." Table 3 includes one example each of a conclusion and setting version from the McClure et al. study.

Insert Table 3 about here.

These investigators found that children's ability to order all sequences improved with age, but that the difficulty in constructing the correct order of events depended upon the type of sequence presented. Third-graders had an extremely difficult time with the question and conclusion versions. However, they were fairly successful in constructing an accurate order of the setting version, which corresponds to the canonical order of events specified by the story grammars. Sixth- and ninth-graders were significantly better at ordering sequences that did not correspond to the canonical order. All of the older children, however, still performed better on the setting version than on the conclusion and question versions.

These data indicate that children are significantly influenced by knowledge of the real-time occurrence of an event sequence, and that they use this knowledge to help construct a representation of the sequence in the text. Furthermore, the results indicate that children's expectations about the real-time order of events overrides other text information such

as pronominal reference, time and contrastive markers, and other such cohesive devices that would permit alternative orders of event sequences. Only older children begin to use cues such as pronominal reference, tense change, and ellipsis, to construct alternative orders of the event sequence. Thus, many of the errors made on this type of ordering task can be said to be caused by children's prior expectations about what the correct order of an event sequence should be.

The more difficult set of data to explain is the third-graders' difficulties with the setting version. Although these children performed satisfactorily on the setting version, McClure et al. (1979) reported that they had some difficulty constructing the correct temporal order of events; this substantiates teachers' beliefs about children's lack of skill on this task. This result is puzzling in view of the young child's excellent ability to recall the correct temporal order of events in a story. However, Stein (1979) also found more errors than expected in a story construction task similar to that used by McClure et al. and concluded that young children's constructions of story order may not totally correspond to real-time order for several reasons.

First, the memory demands involved in reconstructing a sequence of several lines may account for the variability in some of the orders produced during reconstruction. Young children may not be able to attend to all of the various connections that must be inferred in order to work out a sequence of events. Under conditions where working memory is

taxed, young children operate upon a smaller number of units in the sequence and work out the logical relations only within the smaller unit (cf. Kintsch & Vipond, 1979). By using this strategy, children would attend to some, but not all of the possible causal connections that can link the events. The resulting memory representation would include fewer events and passive disorders since not all connections were taken into account.

Another plausible reason for ordering errors lies in children's use of transformational rules. Inversions consistently occur when children order emotional reactions and events, or goals and attempts. For example, in Stein's (1979) study, many children construct this ordering of a story:

- (1) Suddenly Albert was pulled through the water into a boat.
- (2) Albert felt sad.
- (3) Albert wished he had been more careful.
- (4) Albert had been caught by a fisherman.

However, the correct real-time order is 1, 4, 2, 3. The inversion of internal response and emotional reaction with actions indicates that children may indeed accept inverted order information as being part of a "good" story if two events are tightly (causally) connected to one another. These "errors" suggest that children use the because relation to link events, even when attempting to construct a predominantly forward-going sequence of events.

A third reason for variation in children's ordering strategies is that other possible real-time orders do exist. As we stated previously,

inferences made about event order are dependent upon previous knowledge of real world events. There are several ways in which events can be connected, depending upon a child's previous experience, and the type of information made during the comprehension process. Mandler and Stein (1977) illustrate how this can occur.

On one of the subtests of the WISC intelligence test, a series of pictured events are displayed and children are asked to construct the "correct" order of the picture sequence. For example, the correct order of a possible sequence might be: a man stealing some goods from a store, the man facing a judge in the courtroom, supposedly being sentenced for his crime, and the man being put into jail. Mandler and Stein point out, however, that one error that can occur in this type of sequence is putting the jail scene before the trial. In reality, the events may have occurred in this order: stealing, going to jail, participating in a courtroom hearing, and then being put on probation. Thus, different inferences about the relationships connecting events can be easily made which correspond to real-life experience. In fact, recent versions of the WISC subtest allow more than one order to be accepted as correct. The same kind of reasoning may be applied to the orders found by Brown (1976), and McClure, et al. (1979) who used pictorial or verbal narratives. There is a need for studies on the issue of order of events to take into account possible, plausible orders based upon reality and not restricted to one order.

Comprehension of Causal Relationships

So far, we have focused on the young child's skill at recalling and constructing the correct temporal sequence of narrative events. We are aware, however, that recall accuracy does not necessarily imply a full understanding of causal relations (Baker & Stein, 1981; Stein, et al., Note 7). In fact, many previous studies on children's understanding of causal relations raised doubts as to whether preschool and elementary school children could infer appropriate connections among events (Flapan, 1968; Piaget, 1923/1960) or whether they could understand connectives (such as because), which often signal an inversion of cause-effect relations (Corrigan, 1975; Katz & Brent, 1968; Kun, 1978).

In order to provide an overview on children's skill at comprehending causal relationships, we review performance on three different tasks. First, we review evidence concerning children's skill at making any type of causal inference during comprehension tasks. Second, we consider studies designed to investigate the direction and content of inferences made during comprehension. Third, we consider studies that investigate whether children can use inferences made during text comprehension to perform accurately on higher level tasks, such as those requiring the detection of inconsistent information in a story.

Making Inferences during comprehension. One of the first investigators to study children's narrative comprehension was Flapan (1968). After presenting various films to 6-, 9- and 12-year-old children, she asked

them to recall each narrative and answer a series of interview questions. By using why questions, she assessed children's knowledge of the actors' feeling states and the causes of many events portrayed in the film.

Flapan reported several developmental differences in children's responses. In all tasks, she found that older children gave more causal explanations than younger children, as well as giving a greater number of interpretations about an actor's feelings, thoughts, and intentions. When younger children did give explanations for events or did answer questions about the feeling states of actors, the content of their responses often differed from older children's responses. Younger children gave more explanations in psychological terms, using emotions, motivations, and internal states to explain behavior. Another developmental difference was manifested by the types of errors occurring in young children's responses to probe questions. These included (1) an inability to give any answer to the probe question under consideration, (2) responses containing "inappropriate" causes or events, and (3) a predilection for giving the consequence of an event when asked for a cause.

Flapan's results were similar to Piaget's (1923/1960), and led her, as well as other investigators, to the following conclusions. First, because 6-year-olds did not talk about the feelings, emotional states or the motivation of characters, it was hypothesized that these young children were egocentric, and were not very aware of other people's internal states. This proposal was supported by Piaget's view of children's

moral reasoning. He argued that young children do not consider intentions in making judgments about the moral worth of a story character.

Second, Flapan proposed that there was a developmental sequence underlying the inferences children make about film characters. Children infer intentions before feelings, and feelings before interpersonal perception (e.g., one character's awareness of another character). In support of this hypothesis, Flapan cited Gollin (1958) who argued that the use of inference in interpreting observed behavior is a relatively late developmental phenomenon. Flapan, however, was cautious about completely adopting Gollin's viewpoint, as she found some evidence for inferential skills among 6- and 7-year-olds. Since Flapan's (1968) initial study, the field of narrative comprehension has progressed rapidly, broadening our knowledge of children's inferential skills. Reviews of current work, using written and oral stories, as well as films, appear in Baker and Stein (1981), Grueneich and Trabasso (in press), and Stein and Goldman (in press).

The first issue addressed in current work is the young child's ability to infer the internal states of characters, and the causes of other events in narrative sequences. Stein and Glenn (1979) report that 6-year-old children had little difficulty giving the appropriate causes, when asked a series of 'why' questions about each event presented in a narrative. Although Stein and Glenn found developmental differences in answers to probe questions, the differences indicated that

older children give more reasons for the occurrence of an event, rather than giving different types of reasons, as Flapan had reported. Studies subsequent to the Stein and Glenn (1979) investigation have included similar types of tasks, and have shown that children as young as 4 are able to infer the intentions and internal states of characters (Day, et al., Note 2; Nezworski, et al., Note 3; Stein, et al., Note 7). The variable accounting for the differences in the results of recent studies as compared to Flapan's (1968) study or more recent television studies (e.g., Collins, in press; Collins, Wellman, Keniston, & Westby, 1978) may concern the structure of the narrative sequence presented to young children as well as the medium in which the events occur.

Typically, TV and film narratives are not presented in a logically coherent structure but contain much irrelevant, distracting material that interferes with making inferences. In the Stein and Glenn (1979) study, as in the more recent story comprehension work, children are presented with materials that conformed to the notion of an expected sequence, as described in recent story grammars. Thus, certain types of information are included in a narrative sequence, adhering to criteria for constructing a tightly organized causal sequence. Under these conditions, children have little difficulty inferring appropriate intentions and internal states of story characters.

The comprehension difficulties of children, reported by Flapan (1968) and by Collins (in press), appear to be a function of the text structure rather than children's ability to make accurate inferences about the

internal states of narrative characters. Because no a priori structural analyses have been completed on either Flapan's or Collins' films, we cannot say with assurance what is the source of difficulty in children's skill at drawing inferences. From the descriptions of the film sequences, however, it becomes apparent that events which would ensure a tightly organized text are often omitted (Collins, et al., 1978) creating a fairly unstructured sequence.

A second difficulty with many television and written narratives is that the intentions and goals of the characters are often ambiguous, unclear, or must be inferred from other cues such as facial expressions, voice tone, etc. These subtleties may prevent children from making inferences about internal states (Grueneich & Trabasso, in press). Several studies (Bransford & Johnson, 1973; Thorndyke, 1977) have shown that adults have similar difficulties when the goals of the protagonist cannot be inferred, or when the content of the story is ambiguous or unfamiliar. For ease of comprehension, explicit statements about goals and internal states are clearly desirable, especially for younger children.

Making inferences during generation. While young children are capable of making causal inferences when presented with an entire story (Stein & Glenn, 1979), they are also very capable of generating appropriate inferences when given only a single, focal event. That is, they need little contextual support to generate appropriate causes and consequences of narrative events. In an effort to illustrate this kind of skill at

causal thinking, we carried out a series of studies (summarized in Trabasso, Stein, & Johnson, Note 10) investigating generation ability.

In one study, children ranging in age from 5 to 10 years old were asked to generate a response to each of several different types of events, all of which could be classified into one of the categories described in the Stein and Glenn (1979) grammar. Each event could be classified into one of four types: actions, goals, cognitions, and states. Examples are: Joe ran after the ball; Joe wanted a book; Joe forgot to run after Tom; Joe was sad.

In collecting children's responses to these types of events, the following constraints were used. In a control condition, the children were asked to generate spontaneously the first thought that came to mind and to make their response part of a story. Children were told that any response was acceptable, and thus, they were not limited to generating an antecedent or a consequence to the focal event.

In a second condition, children were presented with the same focal events, except that a because was attached at the end of each of the clauses. Children were asked to complete the clause as it would occur in a story. For example, the children were given the clause, "Joe wanted to run after the ball because . . .," and were asked to complete the clause. In a third condition, children were given the same events as clauses with an and then attached to each clause. Again, the children were asked to complete each clause as it would occur in a story.

Our reasons for undertaking this study were two-fold. First, we wanted to provide direct evidence that young children could not only make causal inferences, but could also understand the relational term because, and could easily differentiate antecedents from consequences. As we previously stated, recent studies on children's causal inferences (Kuhn & Phelps, 1976; Kun, 1978), even though showing that preschool children understand causal relationships, suggest that they may not understand how and when the relational term because is used. Some investigators have also implied that young children may have a difficult time generating causes or differentiating them from consequences (Kuhn & Phelps, 1976; Piaget, 1924-1928).

Our second goal was to test some assumptions underlying recent descriptions of story structures. From the description of an episode given in the first part of this chapter, it is evident that certain types of events are assumed to constrain subsequent events. For example, the goal of a protagonist is preceded by an emotional response or an initiating event (e.g., the reason for the formation of the goal) and is followed by a plan of action on the part of the protagonist to attain the goal. If children's knowledge of story events corresponds to the descriptions in the grammars, their response to each type of stem should correspond to those events that seem to be an appropriate cause or consequence for each focal event. For example, the stem, "Joe ran after the ball," should elicit different responses in the antecedent condition than in

the consequence condition. Given that the stem is an action performed by a person, it could easily be classified as an attempt, according to the Stein and Glenn (1979) grammar. In the because condition, the most proximal antecedent response to this stem would be a goal. The most proximal resultant response would be a consequence, where either an end state or another action could be considered appropriate.

The results of the study can be summarized as follows. All the children from 5 to 10 years of age had little difficulty in discriminating causes from consequences. Events generated when the children were asked to finish clauses in the antecedent condition were different from those generated in the consequence condition. After imposing specific criteria for judging whether responses proceeded in a forward to backward direction, we found that even kindergarten children made very few errors in terms of generating appropriate causal events (error rates were less than 4%).

There were instances where younger children did produce consequences in response to clauses ending with because. However, similar types of responses were also given by 10-year-olds. These types of responses are consistent with two distinct meanings of because. The first and most frequent usage refers to the antecedent cause of a focal event. The second usage refers to the logical justification for a focal event. Our data showed that justifications occurred in response to certain types of events, particularly states or cognitions where a cause could not be readily inferred. For example, when children were given the statement,

"It was Sunday because . . .," most replied, "we went to church," illustrating the use of a subsequent event to justify logically the reasons for the occurrence of the event. These results support Johnson's (1939) contention that because may be interpreted as reasons, as well as causal antecedents, for events.

Another set of results was obtained by analyzing the classes of events generated for each of the different types of focal events. The children generated classes of responses that corresponded closely to the type of structural relationships proposed by story grammar in the description of an episode. That is, states (setting statements) preceded and were followed most often by physical events that, in turn, preceded and were followed by cognitions or goals that were followed by actions that led to events that led to emotional states. These results indicate the powerful role of prior (story) knowledge and causal expectations.

A Master's thesis by Surbey (Note 11) shows that 3- to 4½-year-old children can generate appropriate causal answers to specific events, such as emotional or physical states. Surbey examined children's responses to eight states: two physical states (sleepy, hungry), three positive or mixed states (happy, excited, surprised), and three negative states (sad, angry, afraid). Children were asked to generate either the cause or the consequence of each state. The procedures used to collect the data were somewhat different from those used in the Trabasso, et al. (Note 10) causality study. In Surbey's experiment, children were presented

with a picture of a girl or boy, and then told by an experimenter: "This is a picture of Jenny (John for male pictures). One day, Jenny got very sad. She was so sad that her mother and father could tell she was sad." If children were in the cause condition, they were asked, "Why do you think Jenny was so sad?" If they were in the consequence condition, the experimenter asked: "What does Jenny do when she is sad?"

The results showed that these very young children could accurately discriminate both causes from consequences and positive from negative emotional states. Discrimination was measured by the degree to which the distribution of the types of answers correlated for causes and consequences, etc. The near zero correlations indicated little similarity in the kinds of answers given. For example, almost all reasons for sadness referred to external events representing states of loss for the child (e.g., she was sad because her mom and dad left). Reasons given for happiness, however, most often contained statements concerning the prevention of a negative state (e.g., he was happy because he didn't go to sleep hungry), or statements referring to an external event where the child was given some new possession (e.g., a birthday present).

In addition to the low correlation of responses given to positive and negative emotional states, another interesting finding was that children often had slightly more difficulty generating a result or consequence of feeling happy than they did for negative states such as sadness or fear. The data, rather than indicating children's lack of

knowledge about positive states, may be interpreted as indicating that happiness is perceived as an end state, or as a reaction to having attained a particular goal. Negative emotions, on the other hand, appear to motivate the initiation of action to obtain a goal. Since negative states are undesirable, they may motivate goals of changing states. On the other hand, positive states are desired as goals or end states. Thus, one may expect and find negative emotional reactions occurring as internal responses early in stories and positive emotions occurring at the end, as a reaction to goal attainment. The results of this study also correspond closely to the older child's and adult's knowledge of emotional states (Demos, 1974) with similar antecedents and consequences being given by all age groups. Thus, at 3 years of age, much knowledge has already been acquired about personal reactions to situations, especially with respect to the causal events related to emotions.

Detection of Inconsistent Information

So far, we have discussed children's ability to make and generate causal inferences. Another important domain in comprehension concerns children's so-called "metacognitive" ability to monitor their own comprehension (Brown, 1978; Brown & DeLoache, 1978; Markman, 1979). In particular, children's skill at detecting or recognizing logically inconsistent or physically impossible events in text material is thought to be an indicator of good comprehension. According to some investigators (Flavell, 1979; Markman, 1979), certain types of monitoring skills are thought not

to emerge until late childhood, whereas other investigators have argued that 2½-year-olds have metacognitive skills (Clark, 1978; Slobin, 1978), proposing that metacognitive skills are developmentally bound and more dependent upon the type of task used to assess the skill (Brown, 1978; Shatz, 1977).

In this section, we present some work by Markman, which shows the difficulty experienced by elementary school children when comprehension monitoring is assessed. We then include an analysis of her paradigm for investigating children's knowledge of contradiction, and some of our data on the recognition of inconsistent information in a text.

Markman's studies. The primary goal in Markman's (1979) studies has been to investigate children's ability to spontaneously verbalize their awareness of contradictory and inconsistent information within the structure of the text. In one of her studies, third-, fifth-, and sixth-grade children were presented with essays which included either explicit contradictory information, or information representing an implied contradiction. An example of her materials from each condition is presented in Table 4.

Insert Table 4 about here.

After an experimenter read an essay to each child, the child was asked a series of probe questions to determine whether spontaneous recognition of the contradiction occurred. An example of the probe questions used were:

1. Experimenter talking to child: "That's it. That's the information about fishes." (Experimenter pauses and waits for child to spontaneously verbalize the contradictory information included in the text).
2. What do you think?
3. Do you have any questions?
4. Did I forget to tell you anything?
5. Did everything make sense?
6. Can you tell me everything you learned about fishes?
7. Tell me what the essay was about.

After question 7 was asked, more direct probe questions were initiated inquiring whether children accurately remembered the facts in the text, and whether or not the text made sense to them. Markman found that even the oldest age group (sixth graders) had a low success rate for spontaneously verbalizing the presence of contradictory information. Over half of these children failed to recognize the presence of contradictory information by question 7. Performance in the implicit condition was even worse, with the oldest children spontaneously verbalizing contradictory information only a fraction of the time.

Markman argued that the failure to "recognize" inconsistent information was not caused by a memory or inferential failure, for when children were probed about factual material (probes initiated after question 7) they had little difficulty providing the relevant information. When asked to draw the relevant inferences, they could do so. She

concluded that children were genuinely unaware that they had failed to comprehend the material, and discussed her results within a framework supporting the gradual acquisition of appropriate cognitive monitoring skills.

This study suggests that elementary school children may have severe difficulties in detecting logical contradictions in texts. The use of certain methodological procedures, however, may have underestimated the age and ability of children to detect contradictions. Furthermore, the lack of a clear theory of comprehension confounds the interpretation of her results. We know of no theoretical orientation suggesting that a listener would immediately verbalize the existence of contradictory information in a text. It is thought that the major emphasis during comprehension involves "an effort after meaning" (Bartlett, 1932), such that the primary allocation of resources and attention is directed toward constructing a coherent representation of incoming information. A listener may indeed recognize the existence of contradictory information, but may easily construct inferences to reconcile the seemingly apparent contradiction. Thus, when asked a question such as, "That's it. Well, what do you think?," a subject may respond in terms of the implications of the entire text rather than spontaneously verbalizing about the presence of contradictory information. Unless a listener were directly probed about the coherence of the material or their expectations, we would expect little mention of the inconsistency. Indeed, when Markman initiated

probes that included content, more children responded by supplying the contradictory information. Thus, part of the difficulty in eliciting contradictory information may be due to the type of specificity of the question asked to elicit contradictory information.

A related problem is that readers may assume that errors in the text are not intentional. According to Grice (1975), readers or listeners assume that writers use standard conventions to convey what is important and truthful about a particular topic under consideration. Thus, a reader might initially detect an inconsistency, but work out a representation of the text to correspond to what he thought the writer meant. In this situation, the reader may, in fact, transform some of the incoming information, so that it corresponds more closely to what should have occurred rather than what did occur in the text. When transformations of the original text occur in a reader's recall, it is unclear as to whether the reader can still maintain an accurate representation of the original text. Although Markman (1979) reported that memory difficulties rarely occurred in her studies (e.g., children could accurately retrieve contradictory information in her studies), this has not always been the case (Stein, 1979). Often children will delete the inconsistent portion of the text, or transform or substitute information in the original text to correspond with the remainder of the text information. In the case where changes in the original text do occur, it is unclear as to whether the original contradictory information can be retrieved from memory.

A third problem is that the text information may never be perceived as contradictory, specifically because a reader may not have the prerequisite knowledge to "detect" inconsistent information. This phenomenon should occur, however, only in those conditions where the contradictions are implied. An example of this type of contradiction occurs in Markman's implicit condition, and a text presented in her implicit condition is given at the bottom of Table 4.

For the text to be perceived as contradictory, children have to believe certain things about fish, oceans, and light. For example, if questioned, they would have to respond that fish can recognize the color of food only with their eyes and that there is never, under any condition, light at the bottom of the ocean. Since Markman did not assess children's prior beliefs about each of the topics in her essay, we have no way of knowing whether failure to verbalize about an inconsistency was due to the child's knowledge about the objects and events under consideration, or to the type of questions asked. Although children may believe and understand that fish should see with their eyes, they may also believe that there are circumstances where vision is not required. The child might not be able to generate another method of "seeing" color, but he may understand that one could exist. The same is true for the properties of an ocean, or light.

Recent studies in the detection of inconsistencies in text. In an effort to better understand children's skill at recognizing contradictory

information, we (Stein & Trabasso, Note 12) have recently conducted a study where 5- and 8-year-old children were asked to complete several comprehension tasks relating to their knowledge of personality traits and action. Personality traits and actions were chosen because several past studies (see Berndt & Heller, Note 13; Bryan, 1975; Hoffman, 1977; Shantz, 1975) have offered unambiguous support that children make very specific inferences about the appropriate actions of a person described by a particular personality trait. One essential requirement for a child to recognize that information is inconsistent in a text is the belief that only certain types of information can follow from previously presented events. Thus, for information to be contradictory, it must violate the expectations of a listener about what should have occurred in the text.

Since adults use traits to refer to certain classes of a person's behavior, we reasoned that children would do the same. The actions included in trait descriptions, however, may vary as a function of development. Nonetheless, it should be fairly easy to devise stories that contain actions congruent or incongruent with certain personality descriptions. Therefore, kindergarten and third-grade children were presented with stories containing three types of information. First, where character introduction that included a description of the protagonist's habitual trait classification. Second, contextual framework (e.g., an Initiating Event) that set up the necessity of an action or response on the part of the protagonist. Third, protagonist's response to the event

that consisted of a series of actions. For each of the three parts of the story, content was included so that either a positive or negative instance occurred and, therefore, produced congruent or incongruent parts. For example, in one story:

1. John was either kind or mean.
2. John saw his friend Sally fall down in the street (the implication is that John would want to help Sally under normal conditions) or John saw Sally steal his bike and smash it against the wall (the implication is that John will be angry with Sally and retaliate in some way).
3. John went over to Sally, asked her if she were hurt, and offered to help her or John went over to Sally, made a face at her, and then kicked her hard.

Each type of information was systematically varied so that all possible combinations of the types of information occurred. In all, eight different story types were constructed. Table 5 contains examples of two types of stories: one with all positive information, and one with all negative information. Table 6 contains two other stories. The first contains positive trait information, a positive contextual framework, and a negative action response (+ + -). The second contains the mirror opposite

Insert Tables 5 and 6 about here.

in terms of the composite valences: a negative trait, a negative contextual framework, and a positive action response (- - +). Note that the action is incongruent with both the trait and context in both examples given in Table 6. For each story version, children were asked to complete several comprehension tasks: a moral judgment rating of the protagonist, accurate story recall, and a series of probe questions.

In each condition, probe questions were asked in order to elicit more detailed knowledge about the child's understanding of the story. In this discussion, data from the first two questions are considered. The first question asked was: "Did the story make sense to you?" If a child answered no, he was then asked: "What in the story didn't make sense?" For the second question, the child was asked: "Was there something in the story you didn't expect?" If the child's answer was yes, the experimenter then asked: "What didn't you expect?"

The first question, the "sense" question, is similar to Markman's (1979) question ("Did everything make sense?"), and implies that there may have been something in the text that was not comprehensible to the child. The proportion of "No" answers occurring in different conditions are presented in Table 7. Certain information combinations elicited "No" answers more frequently than other combinations. Children in both grades

Insert Table 7 about here.

answered "No" significantly more to stories in which the trait and context were congruent, but the action was incongruent. Other types of combinations did not as frequently elicit a "No" response. Thus, only certain types of incongruities were nonsensical to children.

The probability of citing inconsistent information, given that the child stated the text did not make sense, however, was extremely high in all experimental conditions, as can be seen in Table 8. Children who said the text did not make sense had perceived the inconsistencies in the text. In those conditions where certain inconsistencies occurred, namely (+ + -) and (- - +), both kindergarten and third-grade children detected nonsensical and inconsistent elements at a significantly higher level than had been found in Markman's study. Specifically, over 67% of the third-graders and 46% of the kindergartners detected inconsistencies in those conditions where the actions were incongruent with the trait and context.

Insert Table 8 about here.

The lower rate of detecting "incongruent" information in the other conditions may have been due to the child's interpretation of the "sense" question. On the second question, when children were asked, "Was there something you didn't expect?", they detected and verbalized the relevant incongruent pieces of information significantly more frequently than when asked the first question. However, this change occurred more in the

third-grade responses than in the kindergarten responses, as Tables 9 and 10 indicate. Although the probability of detecting incongruent information

Insert Tables 9 and 10 about here.

rose for kindergarten children when compared with responses from question one, it was evident that many of these children did not detect inconsistencies even if they did respond appropriately to the initial portion of question two.

The reason for not detecting the "appropriate" inconsistent information became more apparent when the kindergarten children's responses to further questions were analyzed. After the initial two questions were posed, additional questions were asked, inquiring if the child expected the character to be described (e.g., personality trait) the way he or she was described in the story and whether the child expected the character to perform the actions that were carried out in the story.

In all those conditions where the character performed negative actions, kindergarten children's responses to the action question (e.g., "Did you expect John to go over to Bob, make a face at him, and kick him hard?") were negative. Over 75% of the children in each condition said they did not expect the action, and almost all children gave explicit reasons. As an example, when the negative action occurred, independent of the trait or context presented in the story, most kindergarten children spontaneously said the action was inappropriate. What was most objectionable to these

children was that the story character physically harmed another character. Thus, they interpreted "expect" evaluatively rather than in terms of integrating the trait or context with the action, as it refers to appropriate consistency of behavior.

The majority of kindergarten children suggested alternative courses of action for the protagonist, saying that not helping another person would be appropriate for a "mean" person, or in response to someone who had stolen your bike. However, physical harm was inappropriate. Third-grade children, however, again responded to this question as they did to the first two questions. If they said they did not expect the action or trait, their reasons almost always pertained to the inconsistent information presented in the text. These older children appeared to have interpreted "expect" in terms of trait and action consistency.

Another difficulty experienced by kindergarten children was the type of behavior they expected once a character was described in certain ways. Children who responded that there was no inconsistency in the character's behavior often volunteered that "you can still be nice even though you were mean before." These children seemed to be unwilling to accept meanness as a pervasive, consistent personality trait, whereas third-graders expected more consistency between a character's actions and traits.

The results from this study show the detection of inconsistent information is a function of several factors. Most important are the procedures used to elicit knowledge of inconsistencies in a text and the prior

knowledge the children bring to the task. In our study, relatively few third-grade children had difficulty detecting inconsistent information when certain combinations of information were presented. Kindergarten children had more difficulty, although half of them noticed inconsistent information.

The major problem for these younger children appears to be concerned with their knowledge base (e.g., what kinds of knowledge they had about human behavior in terms of the predictability and consistency of actions, given certain traits), rather than their inability to make inferences concerning knowledge already available to them. Several of our subjects, especially the kindergarten children, had memory and comprehension difficulties. They often expressed confusion over the character trait or the action of the protagonist, and when questioned, were not sure exactly what had occurred in the text. These errors may be indicative of the child's belief that when information occurring in the text does not correspond to an accurate representation of the child's reality, it should be transformed so that it does conform more to what the child expected. These results are similar to those reported in a study by Wimmer (in press) who use pictures to elicit knowledge about inconsistencies in stories.

Summary

Through the use of materials believed to be familiar to the children and general questioning, children as young as $4\frac{1}{2}$ to 5 years old have

skills at detecting text inconsistencies that were thought to emerge only in the later elementary school years. The critical variable affecting performance appears to be the domain-specific knowledge that children bring to the task about the topic at hand (see Gelman, 1978, for review of the literature on young children's cognitive skills and knowledge). If we are to be successful at instructing children and helping them acquire new skills, then at some point a more accurate assessment of what young children know, as well as what they don't know, must be made. For it is the level of acquired knowledge upon which most instruction is based. Thus, higher level skills, such as comprehension monitoring or the ability to report inconsistencies spontaneously, are also dependent upon knowledge and beliefs about the text information and the social context in which the task occurs.

Memory for Story Events

Another issue receiving wide attention concerns memory for individual events in a given story. In this section, we discuss three aspects of event memory: (1) systematic patterns of event recall from stories; (2) theoretical models and hypotheses that attempt to explain these findings; and (3) tests of some of these hypotheses.

Patterns of Recall

In several studies (Glenn, 1978; Mandler & Johnson, 1977; Mandler, Scribner, Cole, & DeForest, 1980; Stein & Glenn, Note 4, 1979), the pattern

of event recall was found to be highly similar over a wide age group of children and over different cultures. Events in certain categories (or nodes) were better recalled than events in other categories. The most frequently recalled events were setting statements that introduced the protagonist, initiating events, and consequences. The least frequently recalled events were minor setting statements that described the contextual framework for the story events, internal responses, including emotional reactions, cognitions, and minor goals, and reactions, including emotional responses and ending statements. Although not recalled as well as the most salient categories, attempts and major goals were, for the most part, well recalled (Handler & Johnson, 1977; Stein & Glenn, 1979).

Explanations for Patterns of Story Recall

Although the initial studies showed a strong correlation between recall and an event's category membership, this finding is not explanatory. Furthermore, as Stein and Glenn (1979) argue, the variation of item recall within a category, although minimal at times, must also be considered and explained. Several such explanations for these data have been offered (Black, 1977; Black & Bower, 1980; Nezworski, et al., Note 3; Rumelhart, 1977; Stein, 1978, 1979; Stein & Glenn, 1979). All of them generally focus on the structure of an episode and the semantic relationships among the events in an episode. This type of explanation is in direct contrast to a possible "category" explanation, which relies more

on the function of an event in an episode, as well as the temporal location of the specific event.

Rumelhart (1977) offered the first of these explanations when he completed a study on adult summarization and recall strategies. In contrast to his earlier work (1975). Rumelhart chose the multiple episode story as his major focus of attention. He was interested in how stories with more than one goal path would be represented and recalled.

In describing these complex stories, Rumelhart divided the structure of a story into three components. First, the initial event and desire to obtain a superordinate goal, labeled the CAUSE component. Second, the general TRY component, containing the method and attempt for achieving the goal. Third, the OUTCOME or result of whether the goal was achieved. Because complex stories were chosen, Rumelhart emphasized that any of the three major components could contain several subcomponents embedded within the highest component. To illustrate this, Rumelhart chose to describe the TRY component in some detail. This part includes the protagonist's plan and attempt for obtaining the superordinate goal, and often includes a series of subgoals that must be attained before the successful achievement of the superordinate goal.

In describing the tree structure for these types of complex stories, Rumelhart argued that a comprehender would construct different levels of organization for story events, with the superordinate goal, the general TRY component and the outcome being at the highest level. The subgoals, their

attempts, and outcomes would be at lower levels of the hierarchy, depending upon their relationship to the superordinate goal. Rumelhart then proposed that there would be a close relationship between the level of an event in the hierarchy and the probability of its being summarized or recalled. The higher and more general the event, the greater probability of its being recalled. The main factor regulating the level of an event was its relationship to the superordinate goal.

Stein (1978, 1979) and Stein and Glenn (1979) also identified four factors accounting for recall. These are: the causal relationship between each story statement and the superordinate goal (e.g., the direct causes and consequences of the goal), causal relationships between events other than the goal, the causal relationship between an event and the outcome of an attempt, and the inferability of a statement in relationship to other story events.

Black (1977; Black & Bower, 1979, 1980; Black, Note 14), in an attempt to further Rumelhart's (1977) viewpoint, took a problem-solving approach to story recall. Using this approach, the protagonist is thought of as being faced with a problem to be solved and must formulate a plan and set of actions to solve the problem (e.g., to attain the goal). According to Black, the essence of this approach can be described by a hierarchical state transition model, where, in achieving a goal, the protagonist is changing from one state to another.

In predicting memory for story events, Black argues that the comprehender constructs a representation causally linking those events on the "critical" path from the initial events causing the problem to the successful outcome or desired state. The representation of these paths is hierarchically arranged, and corresponds to Rumelhart's (1977) description of complex stories. Thus, Black adheres to the notion of a superordinate and subgoal analysis of stories, with subgoals and specific details composing the lower levels of his hierarchy. The only major difference between Rumelhart's and Black's predictions for recall concern the probability of recalling failed subgoals and attempts. In Black's analysis, goal failures would not be recalled very well because they do not relate directly to the successful problem solution. Rumelhart (1977), however, states that in certain situations, the failure to accomplish a goal should increase the recall of this portion of the TRY component, because the comprehender must know what was done and why it did not work.

Omanson (in press) attempted to identify three different kinds of events in stories: central, supportive, and distracting. Central events are causally related to the outcomes of the protagonist actions. Supportive events are related in more detailed and elaborative ways to central events, functioning much like Rumelhart's subgoal structures (e.g., the TRY component). Distracting events are irrelevant or not causally related to the central event structure. Omanson's assumptions are that comprehenders will recall more central events than supportive and more supportive than distracting.

A common theme underlying all of these explanations is that stories reflect human problem situations, and one of the central components of problem solving concerns the way in which individuals set goals and achieve them (Black & Bower, 1980; Rumelhart, 1977; Stein, 1978, 1979). As summarized in a recent thesis describing a computer model for story comprehension (Wilensky, Note 8), the comprehender interprets a story in terms of the goals and purposes of the protagonist(s). Events occur that give rise to hypotheses concerning the goals and plans of the protagonist. After inferring what the goals and plans of the protagonist are, the comprehender can use these inferences to interpret subsequent actions and outcomes. During this process, a representation of the story is constructed that includes those events that give rise to a goal-directed sequence of events.

Tests of Hypotheses and Explanations for Recall

In this section, we review three studies that bear on the assumption that events which are goal-related (Nezworski, et al., Note 3), causally and purposefully related (Omanson, 1979, in press), and high in the problem solving hierarchy are recalled well.

In a study closely related to previous ones on story recall, Nezworski, et al. (Note 3) pointed out that although the patterns of story recall were consistent across populations, the goal-relatedness of an event, rather than its category membership, should be the more important factor in predicting recall. They argued that from previous studies it was

difficult to determine if this were the case because categorical information varies not only in its form, function, and temporal location, but also in the particular semantic content being expressed. To control for the latter factor, stories were constructed where the semantic information in each of five categories was controlled and directly related (by inferential means) to the protagonist's superordinate goal.

Table 11 contains an example of one of the "standard" stories used by Nezworski, et al. Table 12 includes the information inserted into the five different experimental versions of the standard story. For example, when the inserted information belonged to the Initiating Event category,

Insert Tables 11 and 12 about here.

the two corresponding statements listed in Table 12 were inserted between statements 4 and 5 of the story listed in Table 11.

Nezworski, Stein, and Trabasso had kindergarten and second-grade children (ages ranging from 4 to 9) recall the stories, and answer probe and recognition questions concerning the content inserted into the standard version. The results showed no differences in recall, probed recall, or recognition for the five categories studied. Thus retrieval was independent of the category membership of the information. These findings contrast the pattern found when the content and goal relatedness of story categories were not controlled. As evidence for further support of the importance of goal-relatedness, these investigators also found that recall

of individual story statements within the standard version also varied as a function of the event's relationship to the goal.

Another method of investigating the importance of goal-relatedness is to hold the position and content of a category constant and vary whether the statements are goal-related or causally and purposefully related. Omanson (1979), in a recent Ph.D. thesis, systematically varied the centrality (or the degree of causal relationship) of internal responses and reactions in a story sequence. These two categories of information occurred in three different story versions, where each category was made either central or irrelevant by adding, altering, or omitting other statements. Omanson found that those statements that were causally and purposefully related were rated as more important, summarized twice as frequently, recalled twice as frequently in the immediate condition, and recalled more than twice as often one week later. The only exception to these generalizations was that the emotional reactions were less well recalled, regardless of their centrality.

In a thesis study, Black (1977) constructed stories of common human problem-solving situations (e.g., finding a book in a library) and had college students rate the importance of story statements as well as recall them. Black showed that events on the "critical path," or statements related to superordinate goals, were better recalled than those not so related. However, successful outcomes were not recalled consistently better than unsuccessful ones, as Black had expected.

Thus, in three different investigations, goal-directed causally-related statements were more salient, as measured by their importance ratings, summary likelihoods, and recall. The commonly held view that stories depict goal-directed event sequences where protagonists attempt to solve problems or overcome obstacles seems to be well supported by the data. Children as young as 4 years appear to have sufficient knowledge about human motivation to interpret the events as episodic sequences and to understand that some events are more central than others.

Necessary Advances for a Theory of Importance

Up to this point we have ignored some of the difficulties in defining and constructing a theory of importance because we felt it essential to show the strong support for current frameworks involving theories of human problem solving. However, in order to make new theoretical and applied advances, several current problems must be resolved. One problem underlying all research in this area concerns the criteria used to choose those items that are important or central and those items that are not.

To date all investigators have used subjective methods of assessment. That is, they either decide what is important in terms of their own knowledge or they ask people to choose causally or purposefully related items. While this method is necessary to begin studies, more overt criteria must be established so that a priori predictions can be made about representation. Otherwise, it becomes exceedingly difficult to make any clear

predictions concerning comprehension and importance. An example of this difficulty can be seen by examining one of the stories Rumelhart (1977) analyzed and used, The Countryman and the Serpent.

In this story, a countryman's son steps on a serpent's tail. The serpent in turn bites the son, who dies. The father of the son pursues the serpent in revenge, cutting off parts of his tail. The serpent, in turn, stings the farmer's cattle, causing great losses to the farmer. The farmer then decides that he must make peace with the serpent, but the serpent will not be placated and tells the farmer to take his gifts away. In Rumelhart's analysis of this story, the most important goal (e.g., the goal highest in the hierarchy) was the man's effort to restore peace. This goal occurs after many others in the story. In our subjective assessment, the major goal would be the man's desire to seek revenge, which was never successful. Perhaps Rumelhart decided that peacemaking was the more important goal because it was eventually substituted for revenge. However, when an initial goal is blocked and goal substitution occurs, what are the theoretical dimensions used in deciding the level of placement in a goal hierarchy?

Obviously, the answer lies in the assumptions an investigator makes about theories of naive psychology and a comprehender's knowledge of human motivation. At this date, however, it is not clear what knowledge is being used by a comprehender and what criteria are used for deciding the importance of an item. Thus, it is imperative that we begin to focus

on the development of a process model that incorporates assumptions about knowledge of human motivation. Recent work by Wilensky (Note 8) on representing story information in terms of plans and goal-conflicts and Kintsch and van Dijk's (1978) model for discourse processing are promising beginnings. Hopefully, future work in this direction will account for the set of findings and hypotheses reviewed here. At the moment, we seem to be in a situation where factors and units of importance have been identified, and experimental support has been provided for these hypotheses. How these factors operate to create the structure described by the grammars and other narrative analyses (e.g., the active process of comprehension) remains largely unknown.

CURRENT ISSUES IN STORY COMPREHENSION

In our final section we address three issues which are currently receiving much attention by investigators in the field: (1) the problem of defining the concept of a story; (2) the limitations of current models for the development of process models of comprehension; and (3) the importance of translating current research into practical implications and guidelines for classroom instruction in comprehension.

The Definition of a Story

Despite widespread agreement on several dimensions which define a story (e.g., stories supposedly communicate information about goal-directed activities or problem-solving behavior and contain identifiable constituents

such as episodes, beginnings, endings, etc.), several investigators have raised questions as to whether the current definitions of stories are detailed enough or whether current definitions might be too limited. Implied in these questions are concerns about the psychological validity of the current definitions of stories. The critical question being posed pertains to those features which must be included in an event sequence in order for someone to identify a discourse sequence as a story. Do current descriptions of story structures include all of the possible features which must be included in the concept of story?

These questions have arisen because the dimensions of stories described in much of the recent work do not consider all possible variations that could exist in a given folktale. For example, Rumelhart's (1975) initial description of story structures included only those folktales which contained one episode. Subsequent work, however, by Mandler and Johnson (1977), Stein and Glenn (1979), and Thorndyke (1977) have increased the type of stories which can be structurally represented. For example, stories containing more than one episode can be described, and some of these stories contain more than one protagonist. In fact, by describing how episodes can be embedded in one another (Johnson & Mandler, 1980; Mandler & Johnson, 1977; Rumelhart, 1977; Stein & Glenn, 1979; Thorndyke, 1977) and by describing the nature of the goal structures contained in individual stories (Wilensky, Note 8), it is now possible

to represent the point of view of more than one protagonist in a story. Additionally, Wilensky (Note 8) has enabled us to begin a study of how the specific semantic content could be included in the concept of a story (e.g., he formulates a theory of goal conflict and conflict resolution), while Bruce and Newman (1978) have detailed the description of certain stories containing the interactive plans of two or more protagonists. In these ways, the definition of a story involving the description of problem solving sequences is becoming more detailed in terms of the possible variations that could exist.

The question remains as to whether all of these features are necessary for a piece of discourse to be called a story. Some of the described features may be necessary and others may be optional. Furthermore, specific features included in the concept of a story may change as a function of development or as a function of exposure to different types of stories.

A few initial studies have been completed with this question in mind. Glenn and Stein (Note 6) investigated children's concept of a story by asking children from the ages of five to twelve to tell an example of a "good" story. These investigators found that although the majority of children's stories were episodic in nature and contained motive-resolution sequences, there were several "stories" that did not contain the basic core features described in current models of story comprehension. These stories could be classified into three major subtypes:

1. a descriptive-sequence story, in which states, traits and actions of a protagonist are included, with no temporal constraints on the sequence of events produced. These sequences were more like elaborated setting statements, rather than episodic sequences.
2. an action sequence story, corresponding to Schank and Abelson's (1977) notion of a script. Here, the stories contained habitual everyday actions of a protagonist, temporally arranged in order of occurrence, usually from the beginning of a day to the end. Despite the temporality, there was not necessarily any direct causal connections between the events, nor was there a discernable motive-resolution sequence with a beginning and an end.
3. a reactive sequence story, where there was a beginning and an end, with the events causally related to each other. In this type of story sequence, however, the protagonist never developed a goal or a plan because of external circumstances. The protagonist's well-being was totally dependent on environmental circumstances or actions of other people. Thus the core of a story, the goal or plan, was deleted.

Glenn and Stein found that 48% of the kindergarten children, 31% of third grade children, and 24% of fifth grade children told these types of stories, even when children were asked at the end if they thought that

their stories were examples of good stories. On the other hand, over half of all the children in each grade level did produce stories with an episodic structure as described in current models. Glenn and Stein also found that kindergarten children were almost as likely as third and fifth grade children to tell stories containing more than one episode (e.g., containing more complex variations of the basic story structure).

These results suggest that children, especially those in kindergarten, have a concept of story that is broader than originally proposed in current story models. Since the Glenn and Stein results clearly showed that children of all ages were indeed capable of producing stories with episodic structures, we cannot say that young children lack an awareness of certain story features. Rather, we propose that the critical difference between younger and older children's concept of stories is the number and type of features that must be included in a sequence in order for the child to label it a story. As children develop, their concept of story should become more detailed, so that if a sequence does not contain certain features, it will not be labeled a story.

In order to investigate whether this hypothesis had any validity, we carried out a study in collaboration with one of our graduate students, Margaret Pollicastro. In this dissertation study, seven-year-old children and teachers of elementary school children were asked to judge whether or not different types of sequences were or were not stories. Two different techniques were used to elicit judgments from both children and teachers.

In the first task, subjects were simply asked to judge whether or not each of the presented sequences was or was not a story. In the second task, subjects were asked to rate each sequence on a seven-point scale, with one being labeled not a story, four being labeled a story with all of its parts, and seven being labeled the best story heard.

The type of materials used in this study were constructed to conform to the categories outlined in the Glenn and Stein (Note 6) study, as well as conforming to our rationale of critical dimensions which should be included in a story concept. Stories ranged in complexity from single sentences, which included animate or inanimate objects, to sequences containing only parts of stories, to full episodes. Most of the stimulus materials were varied as to the structural features claimed to be necessary for a sequence to be called a story, however some sequences were varied as to whether or not goal attainment was required to occur in an episode. This was accomplished by having the protagonist succeed in the process of goal attainment or having the protagonist fail at goal attainment.

A critical finding was that significantly more second graders accepted the Glenn and Stein (Note 8) non-motive-resolution sequences as stories than did teachers, indicating that these types of stories are told not because children are incapable of producing more complex stories, but because young children believe these types of event sequences to be stories. The results from Task 2, the seven-point rating scale task,

confirmed the results from Task 1. So clearly, second-grade children have a concept of a story that is broader than originally conceived.

A second set of findings has to do with distinctions made once the sequence is accepted as a story. Causal sequences were rated higher than descriptive or action sequences, and stories that included all parts were rated higher than those missing specific parts. The highest ranking story included a sequence with an obstacle in the path of a protagonist, where the protagonist eventually overcame the obstacle. Brewer and Lichtenstein (Note 15) have completed a similar study with adults and have shown that the normal temporal order of "an ordinary" predictable sequence must be altered in order to induce interest value in an adult. Their findings support the contention that stories must be more complex or unusual in order to be classified as a "good" story.

These results, while interesting and provocative, just begin to tap the surface of the necessary work that needs to be completed in this area. Because writing and comprehension are such central accomplishments for all children, it becomes imperative that we further clarify both the child's and adult's conception and knowledge about various discourse structures, such as the story. Although children may be able to judge different degrees of goodness in stories, their minimal standards for constructing a story appear to be different from adults. Perhaps some of the real difficulty children experience in writing "good" coherent narratives is that their definition of what constitutes a "good" story differs significantly from their teachers'.

We know of no curriculum package to date which describes whether or not this transition occurs and then attempts to delineate the basic components of a story and what it would take to teach children to learn to write good stories. One of the possible reasons for this absence is that many teachers and educators may assume that children have acquired an accurate concept of a "good" story by reading a wide variety of story materials. However, there is no evidence to date that this type of spontaneous learning occurs. Furthermore, it is not clear as to what the degree of consensus would be in determining just what makes a story "good."

Our initial results suggest that there is substantial agreement on the structural components of a "good" story. However, our study did not include all of the possible structural variations which could be included in a story, nor did it include any variations of the semantic and functional features that might be critical to the concept of a "good" story. We suspect that there may not be such wide agreement on what constitutes a "good" story when specific semantic and functional requirements are discussed. Otherwise there would be few debates among film critics or different psychological models of comprehensions as to which one is better.

Because a teacher's beliefs about the "goodness" of written discourse has such a powerful impact on the children being taught, it is critical that we begin to examine exactly what these concepts are, how overtly they are taught in the schools, the methods by which they are taught,

and the degree of success children have in learning the critical dimensions necessary for good writing skills to be acquired.

The Development of Process Models for Comprehension

The way in which the term "comprehension" has been used throughout this article has been somewhat implicit. What we have assumed is that a reader or listener comprehends a story when he or she is able to construct a coherent representation of the story under consideration. The process of representation has been viewed as being influenced by the type of expectations a reader or listener has concerning the information that should occur in a story. It has been assumed that the reader knows what dimensions have occurred in stories and therefore expects to find these dimensions in a story. Presumably, many of these expectations are described in the current story grammars, although we have pointed out that expectations pertaining to the specific type of goal structures in stories, as well as to the specific event knowledge are also important. Once a reader constructs a coherent representation of a passage, this representation can then be used to answer questions, retell the story, or create new stories based upon information in a particular text. Understanding involves the assimilation of events into current schematic knowledge and the retrieval of such events to make further inferences or create new structures.

If this point of view of comprehension is adopted, then it is easy to understand why there has been such a reliance on recall and summarization of incoming information. Both of these measures are highly correlated

with the centrality or importance of an event in an internal representation (Omanson, 1979; in press) and remain a good test for how well the comprehender initially understands and encodes a story (Day, Stein, Trabasso, & Shirey, Note 2). These measures, however, are restrictive when the process of comprehension is considered (Baker & Stein, 1981; Johnson & Mandler, 1980; Trabasso, 1981).

What appears to be lacking is a more explicit model of how comprehension actually occurs. At present, the story representations described by the grammars are structural or outcome descriptions and not process models. They include memorial representation assumptions but not theories about memory operations per se. An ideal process model should take the text as a data base, operate upon it, and represent the underlying ideas as propositions in a coherent framework. Once the representation is formed, operations of retrieval, interpretation, paraphrase, summarization, etc., can be applied. The grammars may be viewed as schemata necessary for the construction of so-called macrostructures, as in Kintsch and van Dijk's (1978) model.

These investigators propose that during comprehension, two representations are successively formed. The first is a microstructure that corresponds closely to the surface propositional structure of the text. The second is a macrostructure that results from operations of using rules and schemata. During the creation of the macrostructure, story schemata are proposed to be critical. These schemata are thought to be used to

construct a more economical representation of a text as well as to aid in the generation of a coherent text. In order to implement schemata during comprehension, it appears that very elaborate process models would be necessary, emphasizing short term memory limitations (Kintsch & Vipond, 1979), and the interaction of schemata with incoming information to create a resulting representation. To date, only a few investigators have approached these issues. It is clear, however, that if we are to make real progress in our efforts at understanding comprehension, more effort must occur in the area of developing a process model.

Educational Issues and Implications

Educators and teachers have been primarily interested in two broad questions: (a) under what conditions does comprehension occur; and (b) if it doesn't how can children be taught to understand what they read. A corollary of the second question is: how can children learn new information from text.

In terms of answering the first question, we have shown that by school age, even young kindergarten children have acquired a great deal of knowledge about stories, and that this knowledge allows them to assimilate much incoming information, provided that the story information conforms to their expectations about what should occur in a story. If the structure or the content of the text violates expectations, then, most often, comprehension will decrease or be seriously impaired. We have reviewed many research

studies which substantiate this claim (see Baker & Stein, 1981; Mandler, 1979; Stein, 1979; Thorndyke & Yekovitch, 1980). Thus, how easily a child understands a story depends upon how well-formed it is.

It is not surprising that basal readers for the early grades rely heavily upon folktales, fables, and myths in the early reading phases. However, many of these texts have been simplified, due to theories about a child's lack of critical vocabulary knowledge. The result of this simplification process is often more confusion and poorer comprehension than if the original elaborated text had been included in the basal reader. Beck, McKeown, McCaslin, and Burkes (Note 17) point out that limitation of vocabulary usage often leads to ellipses in story structure and to the deletion of causal relationship between pairs of statements. Such deletions, disorderings, or distortions place high inference demands on children and most of them are not generative enough to guarantee that accurate comprehension will occur. Thus, whenever possible, the stories written for young readers should be as explicit and as coherently organized as possible, conforming to the notions about importance and structural expectations reviewed earlier in this chapter.

The texts in most basal readers, however, are not necessarily written according to these specifications. As we mentioned before, parts are often missing, irrelevant episodes are often inserted, and causal connections are often deleted, without the author thinking about the consequences of using these techniques. Even in those instances where texts

are written in a coherent and causally organized fashion, children are often not familiar with some of the basic concepts entertained in the passage. If these conditions prevail, what would be the optimal strategy for a teacher to use to ensure that accurate comprehension occurs?

The first necessary task would be to determine just how much children understood about the concepts which are to be included in the story under consideration. This can be done by having the teacher prepare a list of questions, the answers to which are essential for the commencement of the reading lesson. This type of orientation task is not unusual, and many teachers already use such techniques. The difficulty comes in developing assessment techniques to determine whether or not the appropriate questions are being asked, and then developing a productive strategy to use when children can't answer orientation questions in enough detail. Thus, the issue of how children acquire knowledge in a specific content domain becomes a critical issue.

At this time there are few studies which have investigated this issue, especially in the realm of story understanding. It has been assumed by many investigators that because young children do have a great deal of knowledge about story content and structure, that almost any theme can be pre and understood in a text. This is not the case, however. There are substantial content differences in children's knowledge of social situations, as portrayed in stories and film (Bisanz, in press; Flappan, 1968; Goldman, in press; Stein, Trabasso, & Garfin, Note 7). The task is to achieve a level of understanding as

to how and when different types of social concepts are acquired, and what methods are the most successful to ensure acquisition.

For those texts where the child is familiar with most of the content, but where the structure is disruptive or not causally connected in some fashion, there are techniques that have been proposed to ensure better comprehension. Beck, et al. (Note 17) argue that the teacher should use questions to promote the construction of a story map, which corresponds to the definition of an episode and which should help the child construct a coherent representation of the incoming information. For example, each question asked should enable the child to retrieve the central information in a narrative, especially that information that is directly related to the protagonist's goal attainment. If questions like this are asked, the child can quickly decide which information is relevant or irrelevant. Then if information is irrelevant, the child can attempt to understand why the information is irrelevant. This questioning procedure is very much like teaching children the basic components necessary to construct a good summary of the story.

This procedure also allows a child to become sensitive to shifts in points of view. Many stories begin by communicating the goals of one character and then because the first character is dependent on the cooperation of a second character, the story often switches focus to the goals of the second character. In some stories, the sequence never shifts back to the first character, who in fact becomes ancillary to the gist

of the story. By having children use and answer a set of questions which follows the goals, plans, and goal attainments of each character in the story, the child can begin to decipher the important parts from the unimportant parts.

Wimmer (Note 16) completed a questioning study with four- and six-year-old children, where he asked a series of why questions concerning each of the character's attempts in a version of the Donkey story, used initially by Rumelhart (1977). Wimmer found that those children who could accurately answer these questions also scored highest on accurate recall of the story. He also found that children's answers to non-causal questions (e.g., those questions not focusing on the relationship between events but instead focusing on events within a statement; see Trabasso, in press, for a taxonomy of questions) did not correlate with the amount recalled.

Wimmer's results indicate that question-asking is a good assessment procedure to determine whether or not comprehension occurs. Further, his study indicates that the type of question asked is critical in assessing whether comprehension occurs. What is now needed is a study which investigates whether or not questioning can be used to facilitate comprehension and guide the construction of a more economical representation of events, as suggested previously in this discussion.

The necessity for teaching children questioning strategies implies that although they might be able to use schematic knowledge to aid in understanding incoming information, they may not be able to actively

use this knowledge to reorganize incoming information unless specifically instructed to do so. In order to facilitate the ability to reorganize texts, questioning procedures can be used in conjunction with story writing or story construction tasks so that children can pick and choose the type of information that would be appropriate to answer some of the questions necessary to construct a story map.

Rubin (Note 18) has attempted to construct a task that is somewhat similar to this suggestion. She has taken the concept of a story-tree from the current grammars and has constructed a device whereby children can compose stories by making choices among the segments. The resulting story traces the pathway from the beginning to the end, showing children the choices along the way. This type of technique is useful in the following way. First of all, the parts that must be included in a story can be distinctly pointed out, clarifying exactly what types of information should be included in each part. This can be done both at the concrete level, identifying specific knowledge that is relevant to the story, and at the more abstract schematic level, identifying the part of the story under consideration.

In subsequent tasks, parts of the story can be deleted and children can be asked to fill in the missing information, both in the specific and schematic sense. Then children can be asked to produce their own stories. In this way, the concept of a story can be directly taught, specifying the components that must be included in a story. Also, this technique can be used to lessen the memory demands children face when

beginning to learn how to write stories. If children are not initially familiar with all of the components to be included in a story, then the demands of writing may be too much for them. The question remains as to how much children really know about the use of discourse schemata and whether or not they can apply the knowledge they have acquired.

In summary, the use of questioning techniques and story maps get us directly into the arena of how children learn from texts. It is evident that this must become one of the central themes of current research efforts if we are to make a significant impact on policies used in the classroom. The use of schemata can be labor-saving devices for constructing, editing, and reading stories. The conditions under which this use can occur is necessary for future study.

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Table 1
Categories and Types of Causal Relations
Occurring in a Simple Story

1.	SETTING	Introduction of the protagonist; contains information about the social, physical, or temporal context in which the story events occur.
	Allow:	
	Episode:	
1.	INITIATING EVENT	An action, an internal event, or a physical event that serves to initiate the story-line or cause the protagonist to respond emotionally and to formulate a goal.
	Cause	
3.	INTERNAL RESPONSE	An emotional reaction and a goal, often incorporating the thought of the protagonist that cause him to initiate action.
	Cause	
4.	ATTEMPT	An overt action or series of actions, carried out in the service of attaining a goal.
	Cause or Enable	
5.	CONSEQUENCE	An event, action, or endstate, marking the attainment or nonattainment of the protagonist's goal.
	Cause	
6.	Reaction	An internal response expressing the protagonist's feelings about the outcome of his actions or the occurrence of broader, general consequences resulting from the goal attainment or nonattainment of the protagonist.

Table 1 (continued)

Example of a Well Formed Story	
Setting	1. Once there was a big grey fish named Albert. 2. He lived in a big icy pond near the edge of a forest.
Initiating Event	3. One day, Albert was swimming around the pond. 4. Then he spotted a big juicy worm on the top of the water.
Internal Response	5. Albert knew how delicious worms tasted. 6. He wanted to eat that one for his dinner.
Attempt	7. So he swam very close to the worm. 8. Then he bit into him.
Consequence	9. Suddenly, Albert was pulled through the water into a boat. 10. He had been caught by a fisherman.
Reaction	11. Albert felt sad. 12. He wished he had been more careful.

Table 2

Niobe Story: Piaget's Version (1923/1960)

Story Statement	Category Type
1. Once there was a lady	Setting
2. who was called Niobe	Setting
3. (and who) had 12 sons and 12 daughters.	Setting
4. She met a fairy	Initiating Event
5. who had only one son and no daughter.	Setting
(Missing Internal Response)	
6. Then the lady laughed at the fairy	Initiating Event
7. because the fairy had only one boy.	Setting
8. The fairy was very angry	Internal Response
9. and fastened the lady to a rock.	Attempt
10. The lady cried for ten years.	Consequence
11. In the end (she) turned into a rock,	Consequence
12. and (her) tears made a stream	Reaction
13. which still runs today.	Reaction

Table 3
The Conclusion and Setting Versions from
McClure, Mason and Barnitz (1979)

Conclusion Version
1. The border police have found a new helper that drug smugglers cannot fool. (Conclusion)
2. One day, they searched a truck which they thought contained drugs.
3. But they did not find anything.
4. Then they led a German Shepherd to the truck.
5. He sniffed at the truck floor.
6. Pulling it up, the police found a fortune in drugs.
Setting Version
1. One day a suspicious truck drove up to the border.
2. The border police searched it but could not find anything.
3. Then they led a German Shepherd to the truck.
4. He sniffed at the truck floor.
5. Pulling it up, the police found a fortune in drugs.
6. They had also found a new helper that drug smugglers could not fool.

Table 4

Examples of Essays from Markman's (1979)

Explicit and Implicit Conditions

(authors' italics)

Fish: Explicit Condition

Many different kinds of fish live in the ocean. Some fish have heads that make them look like alligators, and some fish have heads that make them look like cats. Fish live in different parts of the ocean. Some fish live near the surface of the water, but some fish live way down at the bottom of the ocean. Fish must have light in order to see. There is absolutely no light at the bottom of the ocean. It is pitch black down there. When it is that dark the fish cannot see anything. They cannot even see colors. Some fish that live at the bottom of the ocean can see the color of their food; that is how they know what to eat.

Fish: Implicit Condition

Many different kinds of fish live in the ocean. Some fish have heads that make them look like alligators, and some fish have heads that make them look like cats. Fish live in different parts of the ocean. Some fish live near the surface of the water, but some fish live way down at the bottom of the ocean. There is absolutely no light at the bottom of the ocean. Some fish that live at the bottom of the ocean know their food by its color. They will only eat red fungus.

Table 5

Complete Positive and Negative Story Versions
(from Stein & Trabasso, Note 12)

Kind Version (+ + +)	
Personality Trait Description	Once there was a boy named John. John was always kind to people. Everyone said that John was a kind, nice boy.
Contextual Framework	One day he saw Sally fall down in the street. She spilled her toys and books all over the street.
Initiated Action	John went over to Sally and asked Sally if she were hurt. Then he helped her get up.
Mean Version (- - -)	
Personality Trait Description	Once there was a boy named John. John was always mean to people. Everyone said that John was a mean bully.
Contextual Framework	One day he saw Bob steal his new bicycle. Bob smashed John's bicycle against a wall.
Initiated Action	John went over to Bob and made a face at Bob. Then John kicked him hard.

Table 6

Inconsistent Story Versions from Stein and Trabasso (Note 12)

Kind Version (+ + -)	
Personality Trait Description	Once there was a boy named John. John was always kind to people. Everyone said John was a kind, nice boy.
Contextual Framework	One day he saw Sally fall down in the street. She spilled her boys and books all over the street.
Initiated Action	John went over to Sally. John made a face at Sally, and then he kicked her hard.
Mean Version (- - +)	
Personality Trait Description	Once there was a boy named John. John was always mean to people. Everyone said John was a mean bully.
Contextual Framework	One day he saw Sally steal his new bicycle. Sally smashed John's bicycle against the wall.
Initiated Action	John went over to Sally. John asked if she were hurt and then he helped her get up.

Table 7

Proportion of "No" Answers to the Question:

"Did the story make sense?"

Story Versions		Kindergarten	Third Grade
Trait, context, actions all positive or all negative	(+ + +)	.12	.08
	or (- - -)		
Trait and context congruent; action incongruent	(+ + -)	.46	.67
	or (- - +)		
Trait and action congruent; context incongruent	(+ - +)	.25	.12
	or (- + -)		
Context and action congruent; trait incongruent	(+ - -)	.12	.20
	or (- + +)		

Table 8

Conditional Probability of Citing Two Incongruent Pieces of Information
in a Story Version, Given a "No" Response to the Sense Question

Story Versions	*	Kindergarten	Third Grade
Trait, context, actions all positive or all negative	(+ + +) or (- - -)	.00	.00
Trait and context congruent; action incongruent	(+ + -) or (- - +)	.70	.87
Trait and action congruent; context incongruent	(+ - +) or (- + -)	1.00	1.00
Context and action congruent; trait incongruent	(+ - -) or (- + +)	1.00	1.00

Table 9

Proportion of "Yes" Answers to the Question:

"Was there something you didn't expect?"

Story Versions		Kindergarten	Third Grade
Trait, context, actions all positive or all negative	(+ + +)	.12	.34
	or (- - -)		
Trait and context congruent; action incongruent	(+ + -)	.47	.78
	or (- - +)		
Trait and action congruent; context incongruent	(+ - +)	.43	.84
	or (- + -)		
Context and action congruent; trait incongruent	(+ - -)	.50	.72
	or (- + +)		

Table 10

Conditional Probability of Citing Two Pieces of Contrasting Information
Given the Detection of "Unexpected" Information

Story Versions		Kindergarten	Third Grade
Trait, context, actions all positive or all negative	(+ + +) or (- - -)	.00	.00
Trait and context congruent; context incongruent	(+ + -) or (- - +)	.47	.76
Trait and action congruent; context incongruent	(+ - +) or (- + -)	.29	.74
Context and action congruent; trait incongruent	(+ - -) or (- + +)	.50	.74

Table 11

Example of the Standard Version of the Secret Trip Story from the
Nezworski, Stein, and Trabasso (Note 3) Study

Category Type	Story Statement
Setting	1. Once there were two kids named Peter and Mary 2. who lived across the street from one another.
Initiating Event	3. One morning, Peter called Mary 4. and asked Mary to come over and play.
Internal Response	5. But Mary wanted to go shopping 6. and she didn't want to tell Peter where she was going.
Attempt	7. So Mary told Peter she was sick 8. and couldn't come over to play.
Consequence	9. Then Mary went shopping 10. and bought a brand new skateboard.
Reaction	11. Mary thought it was a really special toy 12. and was glad she had kept her shopping trip a secret from Peter.

Table 12
 Special Information Categories of the Secret Trip Story
 from the Nezworski, Stein, and Trabasso (Note 3) Study

Category Type	Story Statement Pair
Setting	1. The next day was Peter's birthday 2. and Mary always gave Peter a birthday present.
Initiating Event	1. Mary's friend told her that the next day was Peter's birthday. 2. and that he might like a birthday present.
Internal Response	1. Mary knew that the next day was Peter's birthday 2. and she thought about a birthday present.
Consequence	1. Mary gave Peter a birthday present 2. on the next day.
Reaction	1. Mary was excited about giving Peter a birthday present 2. on the next day.

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